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The Influence of Principal Leadership on Teacher Collaboration: Does Effective Professional Development Mediate this Effect?

David Evertson
University of Nebraska - Lincoln, dave.evertson@gmail.com

THE INFLUENCE OF PRINCIPAL LEADERSHIP ON TEACHER COLLABORATION: DOES EFFECTIVE PROFESSIONAL DEVELOPMENT MEDIATE THIS EFFECT?

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David W. Evertson

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THE INFLUENCE OF PRINCIPAL LEADERSHIP ON TEACHER COLLABORATION: DOES EFFECTIVE PROFESSIONAL DEVELOPMENT MEDIATE THIS EFFECT?

David W. Evertson, Ed.D.

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Adviser: Dr. Jiangang Xia

School leadership has been a topic of empirical, quantitative study for nearly four decades, and in that time a great deal has been discovered about the strategies and mechanisms through which effective leadership acts. In its modern conceptualization, leadership is seen as an organizational construct, not centered on single individuals but rather as leadership activity stretched across leaders, followers and the situation which exists in the organization. Nevertheless, principals continue to play a central role in leadership activity, and their actions, behaviors, and strategies significantly influence school effectiveness and improvement efforts.

Research clearly demonstrates that positive teacher collaboration is an important element in both improvement efforts and in building instructional capacity. In their central role as formal leaders, principals influence both the opportunity and effectiveness of teacher collaboration within their schools. Professional learning communities of teachers have been demonstrated to provide ideal opportunities for teachers to learn collaboratively, develop common goals intended to improve student outcomes, and to work cooperatively as leaders to increase the effectiveness of their schools.

This study employed a multilevel structural equation modeling approach, using data from the United States administration of the 2013 Teaching and Learning International Survey (TALIS) developed by OECD, to quantitatively investigate the influence of principal instructional leadership and teacher-learning based professional development on the levels of teacher collaboration within United States schools. The results indicate that principal instructional leadership significantly and positively influences teacher collaboration, though indirectly, through their support of teacher-learning based professional development. This finding encourages principals to develop and support school structures and mechanisms which encourage teacher-learning based professional development and increased teacher collaboration. This study also concludes that future studies should investigate more fully the conceptualization of teacher professional development and teacher collaboration as shared, school-level constructs.

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Chapter 1

Introduction

All educators are familiar with the normalized bell curve when evaluating student performance. One of the main challenges faced by teachers is to shift the curve so that poorly performing students make greater gains than their peers, while at the same time increasing the performance of all students. This is what Marzano (2007) refers to as the art and science of teaching. Researchers and education leaders widely agree that among factors schools can control, effective instruction has the largest impact on student achievement (Marzano, Pickering, & Pollock, 2001).

But students are not the only learners in schools, and the normalized bell curve can be applied to teaching skill and effectiveness as well. Spend time at any school in the United States and you will get a sense that there are a relative minority of high-performing teachers, a majority who perform well or adequately, and a few who struggle. As do teachers, school principals face the challenge of shifting the performance curve of the teachers they lead. They must improve the performance of their weakest teachers while at the same time encouraging all teachers to improve. Unfortunately, the art and science of leading teachers to improved performance is less well understood than is direct instruction of students.

Teaching is a profession which by its very nature requires continuous learning and improvement as a condition of performing the job itself. This is particularly true for inexperienced teachers. Teachers learn their craft and improve their skills through observation, practice, experiment, and research. But unlike classroom instruction, there is

no prescribed curriculum, and existing skill and experience varies greatly among the teaching staff. There is also wide variation in the contexts and skills required across grade levels and content areas. Even if the principal has supreme mastery of pedagogical content and expertise, they have little time to improve teacher skills through direct instruction of the staff they lead. Clearly the traditional classroom model is not suitable for teacher learning. This presents a complex challenge to principals in their efforts to encourage and support continuous, meaningful improvement for all teachers.

For much of the history of the United states, policy makers and the public viewed teaching as a technical skill which once learned to an acceptable level of competence, could be applied uniformly throughout the remaining career of the teacher. The vestiges of those attitudes toward teaching are still imbedded in our culture. Marzano (2007) reminds us that as late as 1966, the Coleman report entitled *Equality in Educational Opportunity* concluded that "schools bring little to bear on a child's achievement that is independent of his background and general social context" (Coleman et al., 1966, p. 235). In that context, teaching is little more than the technical application of a set of learned skills that, once mastered, are enough to meet the needs of all students.

However, increasing globalization and advancements in technology, particularly after World War II, set our nation on a course of economic leadership and growth which increasingly demands adaptability, innovation and continuous learning on the part of all citizens. The traditional view of public education in the United States was shattered in 1983 with the publication of *A Nation at Risk* (National Commission on Excellence in Education, 1983) which warned that K-12 education was on a downward spiral,

endangering American preeminence. Whether the conclusions of this report were correct or not, public judgement of school effectiveness shifted from the measurement of resources students received to the achievement students demonstrated (Guthrie & Springer, 2004). Holding schools and teachers accountable for this achievement soon followed. Over the next two decades the role of the federal government in education policy increased dramatically, resulting in the No Child Left Behind Act (U.S. Department of Education, 2002), which directed the creation of a uniform set of standards to be taught in all schools along with achievement testing designed to measure student competency in those standards. In stark contrast to the views expressed in the Coleman report, schools are now expected to ensure that all students succeed in meeting achievement goals.

This shift in perception on the part of the public, the increasing influence of the federal government in education policy, and the realities of globalization and technological innovation have changed the demands on schools and teaching as a profession. If schools are to continuously improve to meet both the evolving needs of students and the demands of the public, teachers themselves must also continuously learn and improve. If this is to be achieved on a consistent, systemic level, it requires leadership, guidance, support, feedback, and collaboration among their peers.

Research demonstrates that second only to instruction, leadership has the greatest influence on student achievement. This influence is indirect, acting primarily through teacher attitudes and working conditions. Principals therefor face the challenge of continuously improving instruction by acting on teacher working conditions and

facilitating their learning. The question is, how is this achieved? What are the levers principals can employ to bring about improved teacher and organizational capacity?

Research Problem

Decades of research investigating effective schools and school reform demonstrate that teacher collaboration plays a critical role in school improvement and student success (Darling-Hammond & McLaughlin, 1995; McLaughlin & Talbert, 2006; Slater, 2008). Yet effective collaboration among teachers in schools in the United States is the exception rather than the rule (DuFour, Eaker, & DuFour, 2005; McLaughlin & Talbert, 2006; Murphy & Lick, 2005). The literature also informs us that leadership, while also critical to success, impacts student learning indirectly, acting primarily through its influence on teacher attitudes, working conditions, and school culture (Hallinger & Heck, 1998; Louis et al., 2010). We have a broad picture of the importance of leadership and its action on student learning through these mediators, but there is little research investigating the influence of leadership on specific components of these mediators, most notably teacher collaboration and collaborative professional learning.

A primary function of leadership is to improve both individual and organizational capacity through effective and continuous teacher professional learning and growth. Leithwood, Harris, and Hopkins (2008) note that "the central task for leadership is to help improve employee performance" (p. 29) and that "the primary aim is building not only the knowledge and skills that teachers and other staff need" but also "the dispositions (commitment, capacity and resilience) to persist in applying the knowledge and skills" (p. 30). Bredeson (2000) identifies four areas in which principals can significantly impact

teacher learning: demonstrating that they are the lead learner, the creation of the learning environment for staff, direct involvement in the learning activities themselves, and the assessment of the outcomes of teacher learning.

Successful leaders recognize that teacher learning is not the same thing as teacher training (Sachs, 2016). When leadership is distributed and teachers work together with a shared purpose toward common improvement goals, research informs us that they learn more effectively from each other and that this learning is most effective when embedded within their practice (Mullen & Hutinger, 2008). This improves both individual and organizational capacity (Leithwood et al., 2008; Leithwood, Harris, & Hopkins, 2019). Furthermore, when teacher learning is collaborative and contextual, leadership is more democratic and is distributed based on expertise and context rather than hierarchical position (Hallinger, 2011; Hallinger & Heck, 2010a, 2010b; Leithwood & Mascall, 2008; Louis et al., 2010).

Despite these theoretical implications and what the empirical research clearly tells us about the role of the principal in establishing a learning culture, far too many schools still operate under the traditional conditions of "sit 'n git" professional development and privatized teaching practice. In the absence of a shared mission and support for collaborative efforts to achieve common goals centered on student learning, these schools have a difficult time overcoming the cultural inertia of individualism. For these schools, true collaboration among teachers and continuous organizational improvement is elusive (Bernhardt, 2017; Hargreaves & Fink, 2006; MacNeil, Prater, & Busch, 2009).

Leithwood et al. (2008) identify one of the key elements of effective leadership as "redesigning the organization," which includes "building collaborative cultures" (p. 30). But there is little guidance in the literature to inform principals of exactly what mechanisms might be useful in bringing about this change. Considering the influence of principals on providing professional development opportunities, it is reasonable to suggest that professional development based on authentic teacher learning over simple training could be a key mediator through which leadership acts to promote teacher collaboration. This inferential quantitative study investigates the direct influence of principal instructional leadership on teacher collaboration, as well as the possible mediation of that effect through professional development opportunities which are centered on teacher learning.

Context of the Problem

As a teacher and as an administrator, I have been involved as both a participant and a leader in efforts to "redesign the organization." In the latest effort which I helped to lead, one explicit purpose of the committee was to foster a collaborative culture focused on continuous improvement, as Leithwood et al. (2008) recommend. Our guiding text, *Data Analysis for Continuous School Improvement* (Bernhardt, 2017) is the standard recommendation from the educational service units across the state. Bernhardt advocates a cyclical, explicit framework for school leaders and teacher committees to work through annually, with high degrees of collaborative analysis and organizational planning. Detailed worksheets and flowcharts are provided to ease the burden on leaders in guiding the process. The focus is on the collection, curation and use of data to make collaborative

decisions about school processes and procedures, in the pursuit of increasing achievement for all students. In our case, while progress was positive and noticeable, I can attest to the fact that the process is neither quick nor simple. Redesigning the organization takes time, effective leadership, and a great deal of collaboration.

Schools are complex organizations, each with their own unique situation and cultural setting. As leaders, principals both shape and are shaped by the context which exists within a given school (Muijs & Harris, 2006; Spillane, Halverson, & Diamond, 2004; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006). To be effective in bringing about positive change, leaders must first understand the current culture, and then must act within that context to create the conditions which lead to improvement. Because of this complexity, there is no prescribed list or set of instructions which can be blindly followed to bring about positive change. But it is possible to measure the extent to which certain constructs exist within an organization, and to examine the relationships of those constructs to desired outcomes. Understanding these relationships provides useful guidance to school leaders, even while recommendations for specific actions may be difficult or impossible to achieve.

This study examines the influence of instructional leadership on a specific aspect of the school situation: the extent of teacher collaboration. Collaboration requires individuals to work together toward common goals while allowing for a diversity of opinions and a culture of productive resolution of disagreement (Muijs & Harris, 2006; Mullen & Hutinger, 2008; Stoll et al., 2006). A principal seeking to increase productive collaboration must first understand the cultural context in which teachers will be working

together. Much of that context will be shaped by the previous experience of teachers and the existing norms for professional learning.

The study of leadership. Until the 1980s, there was no established leadership framework to quantitatively connect school leadership effects to student learning outcomes. Hallinger and Murphy (1985) developed the instructional leadership framework as "a research-based definition of the principal's role as instructional manager" (p. 218). This conceptualization was widely adopted as an analytical model over the following decades (Hallinger, 2005, 2011), and has been further clarified and defined as the research has evolved (Rigby, 2014).

Leadership has traditionally been viewed as a set of traits or behaviors demonstrated by hierarchical leaders (principals) within a school. Within this conceptualization, research focused on instructional leadership demonstrates that principals who promote a shared vision of purpose and focus more of their attention on instruction and student outcomes over management and administrative tasks are more effective (Heck & Hallinger, 2005; Leithwood & Mascall, 2008). Instructional leadership encourages principals to emphasize academic goals, improvements in instruction, and providing effective professional development opportunities for teachers. It is reasonable to expect that this instructional focus would influence school culture, leading to a greater degree of teacher cooperation, collaboration, and exchange of skill and techniques. With teachers more proximate to student learning than principals, it is also reasonable to assume that some aspects of instructional leadership would shift from the school level to the teacher level. Indeed, Leithwood et al. (2008) maintain that leadership impacts

teaching and learning most powerfully through influencing staff motivation, commitment, and working conditions.

These results and ideas have more recently influenced the conceptualization of school leadership as an organizational construct rather than as a discrete set of behaviors held by an individual leader. In the distributed leadership framework, leadership action is not strictly associated with individuals or positions but is based on cultural practices within a school. It is woven into the fabric of school climate, culture, and expectations present in the school environment. Distributed leadership is contextual; followers may be leaders for some tasks while leaders may be followers for others (Diamond & Spillane, 2016; Spillane et al., 2004). Leithwood et al. (2008) cite direct evidence concerning the positive effects of distributed leadership along with less direct evidence supporting "the movement towards flatter organizational structures and team problem-solving" (p. 35). The very nature of distributed leadership implies collaboration, as duties and tasks in distributed leadership are shared, are contextual, and are based on expertise over hierarchical position.

While the distributed perspective of leadership extends beyond the role of the individual, principal instructional leadership is still a key component and is subsumed within the distributed context of leadership within the organization. As the instructional leader and direct supervisor of classroom teachers, principals are in a unique position to directly influence collaboration among staff. Murphy, Smylie, Mayrowetz, and Louis (2009) note that despite the importance of sharing leadership across the organization, "all change flows through the principal's office" (p. 181). Given the importance of teacher

collaboration and the central role of the principal in the school hierarchy, it is important to examine what specifically principals can do to create a collaborative culture.

As conceptualizations of leadership have evolved, school environments have become more complex and external pressures on accountability and performance have increased dramatically (Day et al., 2009; Evans, 2008; Guthrie & Springer, 2004; Harris & Jones, 2010). Quite obviously we cannot rely solely on principals as omnicompetent tutors who answer every question and construct every solution. But principal leadership is still important. Leithwood et al. (2008) assert that, "School leadership is second only to classroom teaching as an influence on pupil learning" (p. 27) and that while these effects are generally shown to be indirect, "leadership serves as a catalyst for unleashing the potential capacities that already exist in the organization" (p. 29). The principal plays a key role, not as an autocrat but through influencing staff motivation, commitment and working conditions. These outcomes in turn have positive effects on efforts to improve both individual teacher and organizational capacity through teacher learning and growth. Effective principals work to create a culture in which teachers are learners, continuously acquiring new knowledge, skills and techniques (Harris, 2011; Robinson, Lloyd, & Rowe, 2008). As teachers do with students, leaders must determine *how* teachers learn best.

Teacher learning and growth. What qualities of leadership most influence teacher learning and growth? In revisiting their *Seven Strong Claims About Successful School Leadership* (Leithwood et al., 2008), Leithwood et al. (2019) assert that distributed leadership can have an especially strong influence on student outcomes. While

the patterns of how leadership is distributed vary across schools and is heavily dependent upon local contexts, the key point is that distributed leadership is based on interactions among staff rather than heroic leader actions, and that it flattens the hierarchy, encouraging contextual leadership based on expertise for specific purposes. In other words, instructional improvement depends on both collaborative learning among staff and making use of contextual expertise, wherever it may exist.

Beyond determining the best learning format for teachers, the efficient use of limited time for professional development is a challenge for school leaders on several levels. One problem is that the teaching staff will nearly always be a mix of teachers with different levels of experience and expertise. Another challenge is the range of grade levels, subject areas, and student diversity which exist within the school. A third factor is the staff culture and the willingness to accept instruction from outside sources directed from the top down.

Each of these issues has been recognized in leadership literature since at least the seventies and eighties, in both business and education communities. The concept of a *learning organization* emerged in the private sector as a description of an organizational arrangement that was nurturing to workers and encouraged a high level of collaboration and support in efforts to understand and effect successful change processes. These concepts evolved from the challenges faced by many businesses to adapt to increasing globalization and the rapidly changing technology landscape. Staffing needs were shifting from traditionally static positions in which work was repetitive and relatively small in scope to positions which required continuous adaptation, flexibility and

progression in skills. This produced a focus in both public and private sectors on examining the influence of work settings and workplace culture on the workers themselves.

As a result, research began to emerge suggesting that teachers who were supported in their ongoing learning and improvement were more committed to teaching, and that a strong sense of self-efficacy made teachers more likely to adopt new practices and to stay in the profession longer (Hord, 1997). In the education community, these learning organization concepts are more often referred to as *Professional Learning Communities*, or PLCs (Stoll et al., 2006).

It should also be noted that not all teacher collaboration is oriented to change or improvement. Stoll et al. (2006) observed that professional communities in schools may express a traditional community culture where traditions are reinforced, or a learning community culture where the goal is to "reinvent practice and share professional growth" (p. 224). The influence of leadership on the type of collaboration, and the cultural context in which it occurs are not well understood.

As implied in the name, the conception of teacher professionalism is a key component in professional learning communities. Sachs (2016) examined how external politics and social pressures impact perceptions of teacher professionalism over time and within different contexts, both internal and external. These perceptions range from controlled, managerial contexts in which teachers are viewed as mere technicians to be trained, to occupational or democratic professionalism in which teachers are active

researchers working collectively toward ongoing individual and organizational improvement.

Obviously, the organizational perception of teacher professionalism will influence the types of professional development deemed appropriate for teachers. According to Sachs (2016), when teachers are viewed as technicians whose primary task is to implement policy and meet external standards, professional development is characterized by the *training approach*. The training approach is primarily concerned with upgrading skills to comply with external change agendas and teachers tend to be passive recipients of knowledge. Improvement is directed at the individual, and the need for collaboration is limited. Sachs (2016) contrasts the training approach with the *teacher learning orientation*, in which professional development is meant to be transformative, acknowledging the complexity of education and engendering a desire for continuous learning and improvement on the part of the teacher. According to this view, when professionalism is considered in a democratic light with principals viewing professional development through the lens of teacher learning instead of simple training, teachers become researchers rather than mere technicians. They collaborate to improve not just instruction, but the organization. This collaboration extends beyond the school to encourage partnerships with various stakeholders, which in turn impacts political pressures and social perceptions of the school.

Purpose of the Study

A theoretical framework emerges in the literature. Principals influence student outcomes primarily through their impact on school culture, the sense of professionalism

within the organization, and by increasing the capacity of both individual teachers and the organization. Through instructional leadership principals establish and communicate a common vision of student success and create a sense of shared accountability supported by collaborative learning and a cultural expectation of continuous improvement. When principals support the effective distribution of leadership throughout the organization, professional development becomes more collaborative and focused on teacher and organizational learning over individual teacher training. Thus, effective instructional leadership coupled with higher levels of distributed leadership should lead to increased teacher collaboration, in part through the availability of professional development focused on collaborative teacher learning and growth.

In this framework, increased collaboration and cooperation among teachers is seen as a desired outcome, influenced by multiple factors but significantly dependent upon instructional and distributed leadership, along with professional development which is focused on teacher learning over teacher training. This inferential quantitative study examines the direct influence of instructional leadership on the extent of teacher collaboration, along with possible mediation of this leadership effect through professional development activities which are focused on teacher learning. The central question for this study is, “How and to what extent does principal instructional leadership influence teacher collaboration, and to what extent does this influence act indirectly through professional development activities?”

Chapter 2

Review of the Literature

"Those who can, do; those who can't, teach." This rather cynical idiom from the play *Man and Superman* by George Bernard Shaw (McGraw-Hill Dictionary of American Idioms and Phrasal Verbs, 2002) has been used to disparage primary and secondary education for over a century. One of the ironies of education is that great teachers make learning seem simple, even enjoyable, while poor teachers leave the impression of incompetence. Either way the experience, skill, and hard work required to become a great teacher are undervalued in the eyes of the public. But research in the last decade of the 20th century clearly established the link between effective instruction and student achievement. Marzano et al. (2001), in a meta-analysis of thousands of studies of the effects of teaching practice on student outcomes, inform us that within factors that the school controls, the single most influential component of student achievement is the quality of the teacher and the instructional strategies used by that teacher. Great teaching matters, and becoming a great teacher is not trivial.

Second only to the influence of classroom teaching on student achievement is that of school leadership (Leithwood et al., 2008; Marzano, Waters, & McNulty, 2005). Even more so than with teaching, school leadership is a complex topic which has been extensively researched for many decades. While the debates over the utility of conceptual leadership frameworks continues, it has been well established in the literature that leadership affects student learning, albeit indirectly, primarily through influence on staff factors such as motivation, commitment, and working conditions (Hallinger, 2005;

Hallinger & Murphy, 1985; Leithwood et al., 2008, 2019). School leaders act to create the conditions which lead to improved instruction, which in turn leads to improved student outcomes.

Improving instruction necessarily requires teacher learning and growth, primarily through effective professional development. Research tells us that teachers learn best together and from each other (Lee & Louis, 2019; Muijs & Harris, 2006; Stoll et al., 2006; Vangrieken, Dochy, Raes, & Kyndt, 2015). This means that professional development should be collaborative in nature and focused on organizational learning and improving student outcomes. The role of leadership is to foster the conditions in which such organizational learning and collaboration may occur.

While the literature strongly supports the importance of leadership and the benefits of teacher collaboration for both teachers and students, there is a gap regarding the role that principals play, and more generally the contexts in which leadership acts in influencing the level of effective collaboration among teachers. Specifically, there is little evidence regarding whether formal and informal school leaders influence collaboration among teachers, and if so, what components of leadership are most critical for promoting the conditions and contexts in which collaboration among teachers is most effective. This study is an important attempt to clarify the influence of principal leadership on collaborative teacher learning and practice.

Organization of the Literature Review

This literature review describes the current state of knowledge relating to the topic of this study: the direct influence of principal instructional leadership on teacher

collaboration, with professional development as a possible mediator. The narrative is divided into nine sections. It begins with a brief historical perspective of the study of leadership in education, followed by a review of the current conceptualizations of instructional and distributed leadership frameworks. The fourth section is a summary of the current leadership research landscape.

As previously noted, leadership is critical but acts indirectly on student achievement through the conditions of the school environment. One of those conditions is the extent to which collaboration occurs among teachers. The fifth section examines the importance of teacher collaboration on student outcomes, while the sixth section is devoted to what is currently known about the influence of leadership on such collaboration.

Increasing staff capacity through teacher learning and growth is one of the primary tasks of school leaders (Leithwood et al., 2008), but the role of professional development as a possible mediator in promoting teacher collaboration has not been thoroughly researched. The seventh section of this review will focus on what is currently understood about effective professional development along with the direct influence it has on teacher collaboration and the role of leadership in its promotion.

The eighth section provides a brief summary of the previous sections. The literature review concludes with the final section providing the conceptual framework used for this study, which lays the foundation and provides a lens through which to view the methodology, results and conclusions in the following chapters, within the context of the current body of knowledge and present theory.

Educational Leadership: A Brief Historical Perspective

Leadership has been a topic of research in the social sciences for well over a century. It is beyond the scope of this study to detail all the facets, arguments, and developments which have occurred in leadership research throughout the 20th and early 21st centuries, but as a means of clarifying the current theoretical conceptualizations of leadership in the literature, a brief description is warranted.

Until the 1950s, research exploring organizational administration, particularly in education, was not empirical in nature, relying primarily on anecdotal information related by former administrators. Prescriptions for best practice were based mainly on the experiences of previous school administrators relating their opinions of what worked and what did not. In the 1930s and 1940s there arose growing concern that educational leadership was out of step with public desires and the changing needs of schools (Heck & Hallinger, 2005; Kafka, 2009).

By the 1950s a more scientific, empirical approach was adopted by scholars studying school leadership, though acceptance of the methodologies and analysis used was slow in developing. This was partially due to the lack of well-developed conceptual frameworks in which theories could be proposed and tested (Heck & Hallinger, 2005), and partially due to the long tradition of researchers focusing solely on the ability, traits and style of the formal leader, the school principal (Spillane et al., 2004).

The influence of effective schools research. The emergence of the effective schools movement, which focused primarily on rapid improvements or "turn arounds" of large, urban schools in the United States in the 1970s and 1980s, ushered in the

development of external policies intended to drive school improvement through changing the practice of school leaders (Hallinger, 2005; Heck & Hallinger, 2005; Purkey & Smith, 1983). Principal training and professional development programs began to encourage principals to devote less time to administrative tasks and to focus more of their efforts on instructional management; i.e., direct supervision of curriculum and instruction. Interestingly, this was not the first occurrence of policy makers calling on principals to devote more attention to managing instruction. Kafka (2009) relates that, "In 1873 the superintendent of New York City schools recommended relieving principals of many of their clerical duties so that they could spend more time in classrooms" (p. 323).

This renewed scrutiny on the principal's role in leading instruction stemmed from findings in the effective schools literature suggesting that principal actions influence school productivity (Brookover, 1982; Hallinger & Murphy, 1985; Leithwood & Montgomery, 1982; Purkey & Smith, 1983). Combined with the shift to an empirical, behaviorist approach to understanding school leadership, this led to the development in the 1980s of the first useful conceptual framework for the study of school leadership in a quantitative, empirical way (Hallinger & Murphy, 1985; Heck & Hallinger, 2005). This instructional leadership framework shifted the research focus from descriptions and causes of leadership behavior to the effects of such behaviors on the school and student learning (Bossert, Dwyer, Rowan, & Lee, 1982). Researchers soon realized that few specific behavioral indicators existed to provide guidance to principals as to what exactly they should do to become effective instructional leaders. Hallinger and Murphy (1985), further clarified the instructional leadership framework and developed the Principal

Instructional Management Rating Scale to collect data on the instructional management behaviors of principals. The evolution and use of this framework became the predominant methodology for studying school leadership through the 1980s and is still a popular conceptual lens today (Hallinger, 2005; Hallinger, 2011; Hallinger & Heck, 1998; Rigby, 2014).

Leadership frameworks. Instructional leadership is viewed as a set of behaviors and actions conducted by the school principal to effect change and improvement in both the organization and the staff which they lead (Hallinger, 2005; Hallinger & Murphy, 1985; Rigby, 2014; Spillane et al., 2004). This conceptualization dominated research through the 1980s, but by the early 1990s evolving trends in educational reform began to expand the scope of leadership research beyond the principal's influence on instructional practice (Hallinger & Heck, 1998). While the instructional leadership framework represented a step forward by recognizing the behaviors, rather than just the traits of formal leaders, it soon became evident that to make further progress in understanding leadership, the theoretical framework needed to move beyond those at the top of the organization. Teachers and other professionals also play important roles, and there quickly grew a general disillusionment with "great man" conceptions of school leadership (Harris, 2011; Heller & Firestone, 1995; Leithwood & Mascall, 2008; Smylie & Denny, 1990). In addition, researchers have long recognized that beyond the traits and actions of individuals, leadership behaviors and their outcomes are quite contextual and depend a great deal on the situation in which they are expressed (Hallinger & Heck,

2011; Hallinger & Murphy, 1985; Harris, 2008; Heck & Hallinger, 2005; Leithwood et al., 2008; Spillane et al., 2004).

Driven by these and other limitations recognized in the instructional leadership model, the subsequent decades have ushered in several competing frameworks seeking to define additional constructs and dimensions of leadership (Hallinger, 2011). Some remain relatively focused on the roles of individuals, such as transformational leadership, which examines the distribution of power across stakeholders in effecting organizational change (Leithwood & Poplin, 1992). Others, such as organizational leadership, broaden the conceptual lens beyond individuals to include the reciprocal effects between organizational conditions and leadership activities (Hallinger & Heck, 2010a).

While expanding the scope of theoretical constructs provides a more informed view of school leadership, it also muddies the waters. Often the labels applied to these frameworks are used in different contexts by different researchers, and sometimes the terminology refers only to a style of leadership rather than to an accepted conceptual framework. For example, Hallinger and Heck (2010a) proposed a framework they termed "collaborative leadership" (p. 27), constituting a conceptual framework incorporating the bidirectional nature of shared leadership properties and school contexts interacting with each other. In a different study the same year, they used the term not as a framework, but synonymously with "shared leadership," a term meant to encompass "both formal and informal sources of leadership" as an "organizational property aimed at school improvement" (Hallinger & Heck, 2010b, p. 656). Less than a year later, the conceptualization of this bidirectional framework encompassing both shared leadership

structures and school environmental factors was clarified and renamed as “leadership for learning” (Hallinger, 2011, p. 126). This illustrates both the rapid progress in understanding of leadership in the school setting, and the fluid nature of a very active area of empirical research.

Indeed, Heck and Hallinger (2005) lamented the problems this growing diversity in theoretical approaches creates. Though maintaining that theory is essential in quality empirical studies, they noted that scholars using different conceptual approaches and methodologies “often seem to pass each other blindly in the night” (p. 232), asking different questions and basing inquiry on different assumptions. As a result, they pointed out that it is difficult to integrate results into concrete evidence from which to offer advice to practitioners and policymakers.

Despite the difficulties, Hallinger (2011) asserted that the debates over models and terminology have settled to the point at which consistent patterns have emerged. He goes on to propose that “the term ‘leadership for learning’ has come to subsume features of instructional leadership, transformational leadership, and shared leadership” (p. 126). Thus, the original instructional leadership framework has not been replaced, but has been incorporated into newer conceptualizations, each broader in scope and often in competition with each other. The debates continue today, with the use of distributed leadership as a framework encompassing most of the same constructs as leadership for learning (Harris, 2011; Spillane et al., 2004), though it should be noted that use of the distributed leadership terminology also varies across the research base (Diamond & Spillane, 2016).

For the purposes of this study, instructional leadership is used as a conceptual framework encompassing the behaviors and actions conducted by the school principal to effect change and improvement in instructional practice. Distributed leadership is used in the context of Spillane et al.'s (2004) theory of leadership not just as an organizational property, but as "a distributed practice, stretched over the social and situational contexts of the school" (p. 5).

Regardless of terminology used, the conceptualization of educational leadership in the knowledge base has grown a great deal in scope over the past four decades; from a focus on the actions and behaviors of a lone formal leader to the construct of an organizational property, both influencing and influenced by environmental, social, and situational contexts (Hallinger, 2011; Leithwood et al., 2019). This is not meant to imply that instructional leadership is irrelevant today, nor that the principal does not play a central role in school leadership. Before summarizing the current state of leadership research, a closer examination of the instructional and distributed leadership frameworks is necessary.

The Instructional Leadership Framework

The term instructional leadership is still in widespread use in the literature, often simply as a means of distinguishing the principal's role in leadership from others in the organization. I will revisit its modern use in more detail in later sections. In its original conceptualization though, the primary goal of developing the instructional leadership framework was to describe specifically the actions and behaviors of principals as effective managers of instruction. In this view, principals have many other management

roles, and the primary intent is to help them shift at least some of their focus from these other tasks to what is viewed as the more important task of instructional management (Hallinger & Murphy, 1985).

Dimensions of instructional leadership. Based on previous research of instructionally effective schools, principal instructional leadership is divided into 3 general dimensions: defining the school mission, managing the instructional program, and promoting a positive learning climate. These dimensions are further subdivided into more specific job functions which are implemented by both direct and indirect action on the part of the principal (Hallinger & Murphy, 1985; Hallinger, Murphy, Weil, Mesa, & Mitman, 1983).

Defining the school mission is managed by framing and communicating to staff clear and common goals. Managing the instructional program is accomplished through supervising and evaluating instruction, coordinating curriculum, and monitoring student progress. Promoting a positive learning climate requires the principal to protect instructional time, promote and participate in effective professional development, maintain high visibility, enforce academic standards, and provide incentives for both staff and students which reward success. These dimensions and behaviors are summarized in Table 1 (Hallinger & Murphy, 1985, p. 221).

Twenty years after helping to define the framework, Hallinger (2005) revisited the conceptualization of instructional leadership, noting that with the increased focus on government standards and the strength of the accountability movement, principals

Table 1

Dimensions of Instructional Management

Defines the Mission	Manages the Instructional Program	Promotes School Climate
Framing school goals	Supervising and evaluating instruction	Protecting instructional time
Communicating school goals	Coordinating curriculum	Promoting professional development
	Monitoring student progress	Maintaining high visibility
		Providing incentives for teachers
		Enforcing academic standards
		Providing incentives for students

ignoring their role as instructional leaders do so at their own peril. At that time and through today, researchers have both solidified the original framework and further defined its most notable characteristics. Principal instructional leadership actions have been proven to significantly impact student learning, though the effects are relatively small and indirect. The largest effects act through shaping the school mission and creating a positive learning culture (Hallinger, 2005; Hallinger & Murphy, 1985). Notably, there remains little evidence that direct supervision and evaluation of instruction influences student achievement. Rather, as Leithwood et al., (2008) note, "Leadership acts as a catalyst without which other good things are quite unlikely to happen" (p. 28).

Over the years, these findings have promoted a general perception of what effective instructional leaders are like. They are strong and directive culture builders, focused on both leading and managing. They are goal-oriented and work hands-on with teachers to improve instruction. They lead primarily through a combination of charisma and expertise in teaching and learning and demonstrate a strong commitment to

continuous school improvement (Bossert et al., 1982; Cuban, 1984; Dwyer, 1985; Hallinger, 2005). In short, they almost single-handedly orchestrate the arrangement and activities of numerous components within a complex organization, all with a purpose of improving instruction and student learning.

Limitations of instructional leadership. In enumerating many of the constraints on school leadership, Hallinger (2005) commented that such descriptions of effective principals tend toward "a heroic view of their capabilities that often spawn feelings ranging from inadequacy to guilt among the vast majority of principals" (p. 4). Leithwood et al. (2008) further noted that, "Such heroic aspirations do more to discourage potential candidates from applying for leadership jobs than they do to improve the quality of incumbent leadership" (p. 32). These are a few of the many criticisms in the literature of an over-reliance on the instructional leadership framework. Not only is it unreasonable to expect all principals to possess the personal qualities and energy required meet these expectations; those who do operate in a context unique to their school setting, not easily transferrable to other schools and situations. Other limitations of instructional leadership noted by Hallinger (2005) include:

- Instructional leadership is grounded in research on effective elementary schools and does not translate easily to the often larger and more complex environment of secondary schools.
- It is a rational model of leadership, but schools are not rational environments.
- With its focus on the role of an individual leader, it is difficult to sustain over time and through leadership transitions.

- The classroom is traditionally viewed as the domain of the teacher; leadership influence within the classroom is not always welcome.
- A minority of principals are able and willing to bear the burdens of instructional leadership.

Despite these limitations, instructional leadership is still referred to in the literature as a useful starting point from which to view and study leadership in schools. The body of knowledge has expanded beyond the original conceptualization, and it would be unreasonable to assume that the framework should remain unchanged as the definitive model of desired leadership practices in schools. Many of its characteristics have been reconceptualized and subsumed within other frameworks which are larger in scope and more inclusive of the roles of others in the organization (Hallinger, 2011; Harris, 2011; Hitt & Tucker, 2016; Leithwood et al., 2008, 2019; Marks & Printy, 2003; Mullen & Hutinger, 2008; Spillane et al., 2004). Nevertheless, the term instructional leadership still refers primarily to the actions and behaviors of the principal in managing curriculum and instruction.

The Distributed Leadership Framework

Since the conceptualization and wide-spread adoption of the instructional leadership framework in the 1980s, research has spawned a wide array of adjectives used to describe school leadership. These terms attempt to capture the essence of one or another novel approaches in considering the context, action or properties of school leadership. Adjectives which gain widespread use are invariably applied in different contexts or with slightly different meanings than what were originally intended

(Hallinger & Heck, 2010b; Spillane et al., 2004). Such is the nature of exploratory research pushing into areas which do not have long histories of well-defined and mutually accepted frameworks.

Distributed leadership is one such term. It has often been used as a synonym for shared leadership, collaborative leadership, or democratic leadership, with a basic functional definition of any leadership which is shared with others (Harris, 2011, 2013). Even the early conceptualizations of instructional leadership recognized the need for some sharing of leadership with teachers, particularly in the area of curriculum development and coordination (DuFour & Berkey, 1995; Hallinger, 2005; Hallinger & Murphy, 1985). But the very notion of sharing leadership implies that it is influence exercised by individuals, and that the principal must intentionally take action to distribute the power of this influence to others (Dunlap & Goldman, 1991; Fullan, 2007; Hallinger, 2011; Harris, 2011). As Hatcher (2005) pointed out, if we view leadership as simply a form of power or influence associated with individuals, there is "an inevitable contradiction between the benefits claimed for distributed leadership and the constraints imposed by hierarchical management" (p. 261).

Leadership as organizational activity. A solution to this contradiction was to regard leadership as a property or characteristic of the organization, rather than solely as action and influence exercised by individuals. Spillane et al. (2004) noted that most conceptual frameworks primarily focus on individual agency or restrict the effects of organizational contexts to their influence upon specific leaders. Consequently, they sought to develop a new conceptual framework with a distributed perspective. In this

framework, the focus is on *leadership activity* rather than on leaders. Leadership activity is viewed as a dynamic process which exists as a construct of the culture within a school. Spillane et al. (2004) defined it as "a distributed practice, stretched over the social and situational contexts of the school" (p. 5). It is important to distinguish that the intent of this distributed perspective is to serve as a framework of study, rather than simply as a descriptive practice of sharing leadership.

Spillane et al. (2004) based this conception of leadership on distributed cognition and activity theories of human behavior. In this view, human cognition is always contextual, and purposeful activity must be studied in its "natural habitat" (Spillane et al., 2004, p. 9). They maintained that social context is an integral component of intelligent activity rather than just a backdrop or container, and human activity is "distributed in the interactive web of actors and artifacts" (p. 9) existing in the physical environment. Cognition and behavior do not occur in a vacuum, human thinking always happens within a physical and social context. Even when cognition appears to be a solo act, it shapes and is shaped by environmental, social and cultural artifacts. This structure provides the rules and resources for human agency but is also created and shaped by human activity. Thus: "activity is a product of what the actor knows, believes, and does in and through particular social, cultural, and material contexts" (Spillane et al., 2004, p. 10).

From this distributed perspective, multiple individuals from different levels participate in leadership practices in the pursuit of accomplishing a shared goal or objective. These roles need not be formally assigned as part of the bureaucratic structure and are often temporary. The roles may be shared, and they can cross levels of hierarchy

from low to high. The object of focus is the practice of leadership within the organization, rather than the individuals themselves. Leadership practice exists within the network of individuals in a school, stretched over leaders, followers and situation. A conceptual illustration is provided in Figure 1 (Spillane et al., 2004, p. 11). In this conceptualization, actors respond fluidly to situational needs as a method of collaborative problem solving. Leaders and followers may emerge due to their expertise, experience or time availability, rather than by virtue of position or title (Diamond & Spillane, 2016; Harris, 2008, 2011, 2013; Spillane et al., 2004).

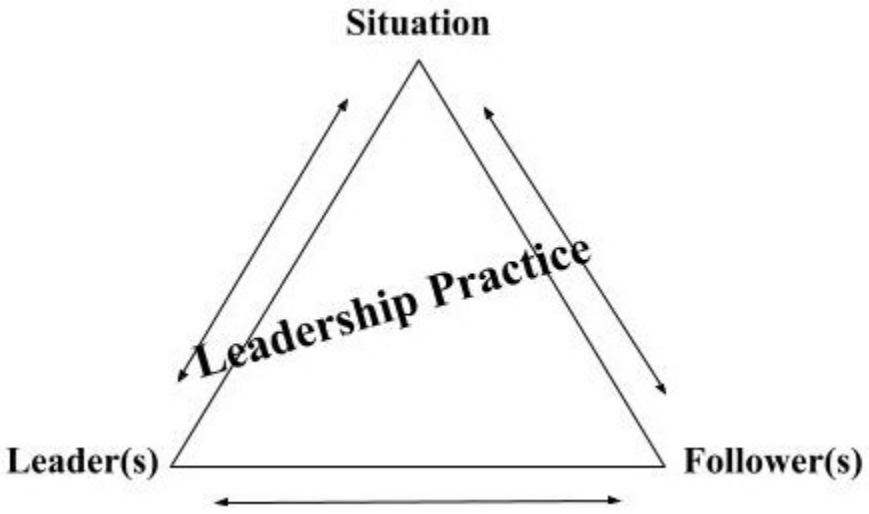

Figure 1. Constituting elements of leadership practice.

The role of the principal. This is not to say that all individuals take on leadership automatically and on demand, nor that positional leadership is irrelevant. Schools are bureaucratic organizations, and structured hierarchy is a large component of the situation

over which leadership activity is stretched. Leadership activity is the unit of analysis, but it is not the same thing as individual leadership. Positional leaders are tasked with managing the organization, which means maintaining efficient and effective operations. Organizational improvement efforts create a tension between maintaining the status quo and satisfying the demands of change. This tension between change and preservation is part of the situation over which leadership activity is stretched, and principals are critical actors in navigating these elements of the environment (Diamond & Spillane, 2016; Harris, 2011; Hatcher, 2005; Spillane et al., 2004). Indeed, as Spillane et al. (2004) noted, "tasks designed to promote change may depend, in substantial measure, on the successful execution of tasks designed to preserve the status quo" (p. 12).

The study of leadership activity is more complicated in the distributed perspective than it is in the instructional leadership framework. When considering the social components of distributed leadership, it is important to understand how leaders work together and separately, as well as the role of followers. Influence between leaders and followers acts in both directions, there is a "negotiated order" (Spillane et al., 2004, p. 19) in which leaders are dependent on the followers they lead. The interdependencies between leaders, followers and situation are critical elements of leadership activity. Thus, Spillane et al. (2004) argued that this model is multiplicative rather than additive. The collective cognitive properties of a group consisting of multiple leaders and followers potentially generates leadership activity which is greater than the sum of individual activities.

This means that formal leaders reflecting on their practice must adapt their behaviors and actions to the characteristics of their staff and the school situation. This adaptation is continuous; factors which mediate leadership practice are also mediated by that practice. Principals should keep in mind that the situation in which they operate is not external to leadership activity, but one of its core elements. Situation can both enable and constrain practice, and the most effective leaders are often those who can turn constraints into advantages (Harris, 2011, 2013; Spillane et al., 2004). For example, a principal may feel constrained as new communication technologies emerge which increase the number of discipline incidents and the volume of communication activities in which they must participate. This change in situation demands more of their already limited time, constraining their leadership practice. But the principal may also choose to adapt new technologies to save time or extend leadership influence by more efficiently communicating with staff, students, and patrons.

The impact of distributed leadership on the organization. In addition to issues of definition, a common misinterpretation of distributed leadership is that it is the opposite of traditional top-down, autocratic leadership. Harris (2011) pointed out that distributed leadership should be viewed as an alternate means of analysis and interpretation of leadership practice, primarily concerned with co-performance of leadership and how situation interacts with both formal and informal leadership practice. Though common, the implication of an autocratic vs. democratic dichotomy is unproductive (Harris, 2013). Distributed leadership is not a methodology of transferring power from one to many. It is rather, a perspective from which to view and study

leadership activity through a more inclusive lens. In fact, the role of the principal, while different from more autocratic models, is just as critical in distributed leadership (Day et al., 2009; Harris, 2013; Leithwood et al., 2007). Harris (2011) maintained that without the principal's support, "distributed leadership is unlikely to flourish or be sustained" (p. 8).

From a distributed perspective, how formal leaders interact with other potential leaders and teachers is more important than their precise role or function (Harris, 2011, 2013). Diamond and Spillane (2016) noted that in previous studies, principals' cultural capital had a larger influence on teachers than their positional authority. Effective principals continually restructure and redesign the organization to create conditions which make effective leadership by others more likely. They actively develop the leadership capacity of others and create patterns of influence to support that leadership growth (Day et al., 2009; Harris, 2011, 2013; Leithwood et al., 2007). As Harris (2011) noted, "This is not to suggest that the principal no longer sets the strategic direction for the school" but that "the role is now to orchestrate the talent and leadership capability of others to move the school forward" (p. 15).

Research by Hallinger and Heck (2010a, 2010b, 2011), Harris, (2008), Louis et al. (2010), and Leithwood and Mascall (2008) has indicated a positive relationship between distributed leadership, organizational improvement and student outcomes. However, Day et al. (2009) noted that this occurs by design, not by default. The role the principal plays, and what they specifically do in relation to the situational context, matters a great deal (Harris, 2011; Leithwood et al., 2007). Successful schools are deliberate in their

action of restructuring, generating flatter hierarchies, creating new collaborative teams both vertically and horizontally, and encouraging greater responsibility and accountability on the part of those other than the formal leader (Harris, 2013). Harris (2011) noted that this is not simply a matter of increasing the number of leaders, but of increasing the quality of leadership across the organization.

The impact of distributed leadership on teachers. More proximate to student learning is the impact of distributed leadership on teachers. Research has shown positive relationships between distributed leadership and teacher self-efficacy and motivation, along with improvements in engagement and morale in both teachers and students (Day et al., 2009; Harris, 2011). Harris (2013) suggested that distributed leadership practices enhance schools' capacities for organizational change and learning. This is important as policies place increasing emphasis on improving teaching quality through shared or collective professional learning.

Improved performance and growth on the part of teachers is one benefit of distributed leadership, but teachers also possess expertise and experience which principals are often unable to provide. Hallinger and Heck (2010b) commented that unlocking this latent teacher leadership capacity for the purpose of organizational improvement is another benefit of distributing leadership and increasing collaboration.

The Current Leadership Research Landscape

A useful perspective for viewing the current state of research in educational leadership is to consider its evolution from the initial efforts of Hallinger and Murphy (1985) in developing the instructional leadership framework. As noted previously, this

framework was conceived to enable systematic, quantitative study of principal practices and their effects on instruction and student learning. Though decades of leadership research preceded this effort (even the term instructional leadership was not new), this framework can be viewed as the well from which most contemporary frameworks of educational leadership have sprung.

Limitations of the original conceptualization of instructional leadership were recognized early on: it was too focused on the activities of the principal, it reinforced a heroic view of leadership which few could attain, it ignored the leadership contributions of others, and it did not consider contextual factors of the staff, school and environment (Boyce & Bowers, 2018; Diamond & Spillane, 2016; Hallinger, 2005; Hitt & Tucker, 2016; Robinson et al., 2008). Throughout the 1990s and 2000s various competing models arose seeking to address these limitations, including transformational leadership (Leithwood, 1994; Leithwood & Poplin, 1992; Silins, 1994) shared leadership (Hallinger & Heck, 2010a; Heck & Hallinger, 2009; Marks & Printy, 2003), distributed leadership (Diamond & Spillane, 2016; Harris, 2011, 2013; Leithwood et al., 2007; Spillane et al., 2004), and leadership for learning (Boyce & Bowers, 2018; Hallinger, 2011; Hallinger & Heck, 2010b). Though debates over the utility of each of these models were at times sharp, consistent patterns of effective practice have emerged from the empirical results (Hallinger, 2011; Klar, Huggins, Hammonds, & Buskey, 2016; Leithwood et al., 2008, 2019).

Instructional leadership has not been replaced so much as become a component of modern conceptualizations of leadership in education (Hallinger, 2011). The lens has

widened while the growing body of empirical evidence has sharpened the view. The principal is still the central actor (Harris, 2013), but they do not act alone, nor in isolation from the context of the school and the wider social environment. Instructional and distributed leadership activities are not mutually exclusive but are different and complementary parts of leadership practice. The main goal of the effective leader today is to improve teacher performance by positively influencing working conditions, beliefs, values, motivations, skills and knowledge (Leithwood et al., 2008).

Modern leadership practice. Since the dawn of the 21st century, the empirical understanding of what effective leaders do has steadily converged to general agreement in the literature. In *Seven Strong Claims About Successful School Leadership*, Leithwood et al. (2008) summarized the key findings of a comprehensive review of the literature on effective school leadership. The authors recently revisited that original work, updating their claims to reflect the current state of scholarly understanding of educational leadership (Leithwood et al., 2019). They divided effective practice into four domains describing what successful leaders do: Set directions, build relationships and develop people, develop the organization to support desired practices, and improve the instructional program. Within these domains, they provided specific leadership practices. These practices are summarized in Table 2 (Leithwood et al., 2019, p. 4).

While evidence supporting these practices is robust, describing *what* effective leaders do has proven to be much easier than has been offering advice on *how* they should do it. As Harris (2013) notes, “The leadership field is already replete with

Table 2

What Successful Leaders Do

Domains of practice	Specific leadership Practices
Set Directions	• Build a shared vision • Identify specific, shared, short-term goals • Create high-performance expectations • Communicate the vision and goals
Build Relationships and Develop People	• Stimulate growth in the professional capacities of staff • Provide support and demonstrate consideration for individual staff members • Model the school's values and practices • Build trusting relationships with and among staff, students and parents • Establish productive working relationships with teacher federation representatives • Participate with teachers in their professional learning activities
Develop the Organization to Support Desired Practices	• Build collaborative culture and distribute leadership • Structure the organization to facilitate collaboration • Build productive relationships with families and communities • Connect the school to its wider environment • Maintain a safe and healthy school environment • Allocate resources in support of the school's vision and goals
Improve the Instructional Program	• Staff the instructional program • Provide instructional support • Monitor student learning and school improvement progress • Buffer staff from distractions to the instructional work

formulaic solutions and neat check lists that fail to deliver all they promise" (p. 10). What is needed from the research community is to extend what is currently known by examining how leaders enact these practices and measuring the impacts. This requires stronger designs and more longitudinal studies (Leithwood et al., 2019). As Hitt and Tucker (2016) noted, what school leaders need is "knowledge about specific, high-yield practices that can guide their daily professional lives" (p. 562).

The Importance of Collaboration

"Isolation is the enemy of improvement" is a slogan that appears in many educational studies (Jamentz, 2002, as cited by Gumus, Bulut, & Bellibas, 2013). Sustainable school improvement which leads to increased student achievement has been shown to be heavily dependent upon leadership distribution and a collaborative approach among teachers and leaders, particularly in instructional improvement (Lee & Louis, 2019). Decades of research on leadership, school culture, professional development and teacher collaboration reveal that in successful schools, teachers work together toward common goals. They share a vision of continuously improving student achievement and a focus on organizational improvement (Bernhardt, 2017; Leithwood et al., 2008, 2019). In these schools, leadership is more democratic and is distributed based on expertise and context rather than hierarchical position (Hallinger, 2011; Hallinger & Heck, 2010a, 2010b; Leithwood & Mascall, 2008; Louis et al., 2010).

Barriers to productive collaboration. The traditional view of teaching and the bureaucratic structure of schools create an inertia which is difficult to overcome. In the absence of purposeful intervention to create a positive collaborative culture, school structures can be very isolating to both teachers and administrators (Goddard, Goddard, & Tschannen-Moran, 2007). If leaders do not intentionally create structures and supports for staff to do meaningful work together, there is little time for professional interaction and little structure for productive collaboration among teachers. Where collaboration does occur, it is superficial and informal, and frequently reinforces negativity (Louis et al., 2010; Mullen & Hutinger, 2008). Under these conditions, teachers are expected to

figure out both effective instruction and classroom management with little assistance from more experienced staff, while principals are expected to supervise instruction, manage operations efficiently and heroically implement changes for improvement from the top.

Under these default conditions, a supervisory observation once or twice per year and a few professional development days may be the only official supports provided for teachers to improve instruction. If executed poorly, Klar et al. (2016) noted that these activities do more to increase cynicism and encourage isolation than they do to improve instruction. In such school cultures, motivation to improve professional practice becomes almost exclusively intrinsic and focused on individual improvement alone. Organizational change initiatives are often met with passive but determined resistance from experienced teachers seeking to maintain the status quo. These teachers develop the view that such group efforts are a waste of valuable time. Lee and Louis (2019) pointed out that schools in this condition have become "stuck" (p. 85), and reform efforts are episodic, inconsistent and generally short-lived.

Clearly, avoiding this type of culture is desirable and most reform efforts emphasize the need for developing collaborative cultures (Goddard et al., 2007). Increasing collaboration does more than reduce isolation and help to deprivatize teaching practice. Research indicates that it also improves teacher learning and professionalism, organizational capacity, school culture, student achievement, and the sustainability of improvement efforts (Goddard et al., 2007; Lee & Louis, 2019; Muijs & Harris, 2006;

Stoll et al., 2006; Vangrieken et al., 2015). Stoll et al. (2006) noted that while building collaborative structures is not easy, it is worth the effort.

Teacher learning. In a changing and complex world, professional learning cannot remain an individual practice. Successful reform requires that educators work and learn together, taking charge of change and finding the best practices to enhance student learning. Building individual and collective capacity is critical to improving instruction in the classroom and across grade levels and subjects (Stoll et al., 2006). Teachers who collaborate report more confidence in their skill, knowledge of student performance, contact with parents, and knowledge of how other teachers work (Goddard et al., 2007). Goddard et al. (2007) also noted that "The more teachers collaborate, the more they are able to converse knowledgeably about theories, methods, and processes of teaching and learning, and thus improve their instruction" (p. 879). In other words, teachers learning from each other become better teachers.

Stoll et al. (2006) pointed out that instruction is inherently complex and non-routine, and teachers must continuously learn and adapt. Research pushes best practice forward, and external political and social pressures create new expectations on schools and teachers. In isolation, teachers must grow and adapt through an inefficient process of trial and error. When learning together, teachers can tap expertise possessed by peers and colleagues as well as provide each other with emotional support and encouragement. Mutual engagement allows teachers to experiment, analyze, and evaluate teaching methods together, learning from each other more efficiently and to a greater depth. Vangrieken et al. (2015) noted that collegial support and learning occur across

generations as well, and in both directions. Veterans share wisdom and experience while younger staff can help to support new methods, technologies, and communication skills.

Professionalism. Professionalism takes on many different meanings in the literature (Sachs, 2016), but in this case I refer to the usage from the concept of professional learning communities or PLCs. Stoll et al. (2006) informed us that there is no universal definition of a professional learning community in the literature, but there is broad consensus that it "suggests a group of people sharing and critically interrogating their practice in an ongoing, reflective, collaborative, inclusive, learning-oriented, growth promoting way" (p. 222). They went on to explain that the concept of the PLC seems to have emerged from several sources within the teaching profession along with those supporting school improvement and has become especially prominent since the mid-1990s. Professionalism in this sense refers to a blend of behaviors and attitudes on the part of educators which focuses on continuous, reflective, collaborative learning and betterment of practice directed toward improving student outcomes. In PLCs, educators are characterized as knowledge workers pursuing collective learning (Lee & Louis, 2019). This stands in stark contrast to the previous description of privatized instruction with teachers retreating cynically to their classrooms, choosing the relative psychological safety of isolation and private practice over poorly executed attempts at top-down improvement (Hallam, Smith, Hite, Hite, & Wilcox, 2015).

Teacher collaboration enhances professionalism by promoting reflective professional inquiry, deprivatization of practice, observation of and learning from other teachers, joint planning, seeking new knowledge through interaction, and applying new

ideas to problem solving to address student needs. Instead of compliance, it is cooperative learning. Within the professional learning community, leadership roles are based on expertise, situational knowledge and skill rather than position. All teachers are learners, and group learning is promoted as well as individual learning. There is evidence that this type of professionalism increases teacher confidence, belief in their power to make a difference, enthusiasm for teaching, and commitment to improvement (Goddard et al., 2007; Lee & Louis, 2019; Muijs & Harris, 2006; Stoll et al., 2006; Vangrieken et al., 2015). This in turn impacts students by increasing motivation and improvements in performance (Gumus et al., 2013; Stoll et al., 2006). There is also evidence that teachers are more likely to stay in schools where a culture of teacher collaboration exists (Ingersoll, Merrill, & Stuckey, 2018; Mujis & Harris, 2006).

It should be noted that these positive benefits do not arise automatically from simply forming collaborative teams of teachers. In weak cultures or in conditions of laissez faire leadership practice, collaboration can be negative as well (Hargreaves & Fink, 2006; Mujis & Harris, 2006; Vangrieken et al., 2015). Teachers must be guided and learn how to collaborate effectively, with leadership distributed carefully and intentionally (Harris, 2011). Stoll et al. (2006) related research that indicated there must be trust, purpose, leadership and structural supports in place. What is critical is the focus on the group learning process. While teachers can learn from and support each other in their learning, there needs to be formal and expert professional development as well, usually from external sources. The learning is experiential and reflective, it is not just a matter of raising awareness of critical issues. PLCs are a means to this end; they are not

themselves an end goal. But in schools that are operating as professional learning communities, Mujis and Harris (2006) noted that "there [are] significant and positive effects on student learning where the norms of collaboration and teacher professional learning are in place" (p. 971).

Organizational capacity. With an increase in individual teacher capacity and professionalism, organizational capacity also increases. This can be thought of as group or organizational knowledge and skills, not specifically held by individuals but as a collective property. Stoll et al. (2006) maintained that building both individual and collective capacity is critical for improvement, and that effective collaboration leads to the most efficient use of human and social resources available to the school. Leithwood et al. (2008) related research showing that increasing capacity is one of the primary paths through which leadership influences student achievement. Goddard et al. (2007) considered collaboration as a form of lateral coordination in the organization, leading to improved performance through increased creativity in solving problems. They reported a moderate increase in math and reading achievement of 0.1 standard deviation when teacher collaboration increases by 1 standard deviation.

Increasing organizational capacity through improved collaboration leads to greater adaptability, more innovation and a greater focus of collective attention on important issues and problems, most notably in student learning. It also helps to flatten the power structure, increases equity for students, and improves teacher retention (Ingersoll et al., 2018; Vangrieken et al., 2015). Muijs and Harris (2006) commented that, "Instead of bringing about 'quick fixes' or superficial change, [PLCs] create and

support sustainable improvements that last over time because they build professional skill and the capacity to keep the school progressing" (p. 971).

School culture. Does collaboration build school culture, or does culture lead to greater collaboration? Culture is a difficult construct to measure quantitatively and its conceptualization and terminology varies in the literature (Lee & Louis, 2019). Hallinger (2011) viewed culture as a contextual factor which must be understood and adapted to by leaders if they are to be effective. It both shapes and is shaped by practice. The reciprocal nature of this view is appropriate when considering the relationship between collaboration and school culture. Vangrieken et al. (2015) noted that teacher collaboration is essential if we want to restructure and change the existing culture of a school. Yet in the absence of a collaborative environment, formal leaders must cultivate a culture that supports professional collaboration and encourages greater individual and organizational capacity.

Semantic arguments of which takes precedence aside, the outcome is what matters. The objective is for schools to improve by increasing individual and organizational capacities. This requires a focus on learning, so we return to the professional learning community as a guide. Collaboration is a means to that end; it is both implied in the name and is expected as a norm. Effective PLCs establish an internal culture of collective responsibilities, shared values and vision, and a focus on student outcomes. Group and individual learning are both promoted, and through this process professional self-renewal and growth occurs. This requires mutual trust, respect, and

support within the group, but the community looks beyond the group and school boundaries for the sources of that learning (Stoll et al., 2006).

When PLCs are implemented well, a culture is established within the professional learning community which extends outward to the school. As Muijs and Harris (2006) put it, "Building capacity for school improvement suggests a view of the school as a professional community where teachers have the opportunity to learn from each other and to work together" (p. 961). This is not an automatic process; simply forming groups of teachers and calling them "professional learning communities" is not sufficient. Leadership plays a critical role, primarily through establishing a vision and setting direction. In redesigning the organization, formal leaders must understand and develop people to establish the conditions which allow staff to be at their best (Leithwood et al., 2008). The careful implementation of PLCs as vehicles for collaborative professional development can be a powerful tool in that redesign. But it requires "the collaborative efforts of administrators and teams of teachers, and the degree of trust within the school's collaborative culture significantly affects PLC effectiveness relative to the performance of students" (Hallam et al., 2015, p. 194).

Collaboration and student achievement. According to Hallam et al. (2015), professional learning communities are recognized as improving the quality of teaching, and improved teaching has been linked to improved student achievement (Marzano, 2007; Marzano et al., 2001). Vangrieken et al. (2015) pointed out that collaboration among teachers is a powerful cooperative learning model for students to follow in their own learning, and that it leads to improved student understanding, success and learning.

Stoll et al. (2006) claimed that collaborative professional development leads to enhanced student motivation and performance, and they cited several studies indicating that: a learning enriched workplace (for teachers) leads to better academic progress (Rosenholtz, 1989), schools with positive professional communities experience higher academic achievement (Louis & Marks, 1998), and that achievement in 8th an 10th grade was higher in schools with collective responsibility among teachers (Lee & Smith, 1996). Goddard et al. (2007) found that elementary teacher collaboration on tasks related to their practice increased student achievement in mathematics and reading.

Stoll et al. (2006) commented that while there is some evidence supporting a significant, positive impact of intermediate variables such as collaborative teacher learning and professional staff relationships on student achievement, the influence appears to be primarily indirect and accounts for less variation than factors more directly related to the teaching and learning process. In other words, teacher collaboration and collective professional learning acts in much the same way as leadership. Direct effects on student learning are small, but like leadership, collaboration helps to establish the conditions, beliefs and attitudes within the school which promote improved instruction, and consequently student success. In the absence of positive leadership and a collaborative culture, good things are less likely to happen.

Sustainability of improvement. In her introduction to *Data Analysis for Continuous School Improvement*, Bernhardt (2017) related a question that she commonly asks of teachers and administrators who participate in her workshops: “What would it

take to get learning growth for every student, every year, in your school?" (p. 1). Among the answers she shared from her decades of consulting:

- "There must be one vision for the school – we have to get everyone on the same page and moving together."
- "One plan to implement the school vision must be in place. We cannot implement multiple unrelated plans."
- "Curriculum, instructional strategies, and assessments must be aligned. . . ."
- "Staff need to collaborate and use student, classroom, grade level, and school level data. Teachers need to work together to determine what they need to do to ensure every student's learning."
- "Staff need professional learning to work differently when the data tell them they are not getting the results they want. . . ."

It is difficult to imagine accomplishing any of those conditions without a great deal of collaboration among teachers and administrators. While it is possible (and unfortunately, relatively common) through strict autocratic leadership to "officially" create and enforce a single unified vision, plan, and curriculum, the result is compliance rather than collaboration. This leads to a lack of ownership and trust on the part of teachers, and Hallam et al. (2015) noted that in such an atmosphere "teachers seek to minimize their vulnerability to the principal and the other teachers, and the resulting self-protection increases disengagement from the education process" (p. 194). In other words, the school is "stuck" and improvement efforts will not be sustained.

Collaboration is vital if efforts of school improvement are to be sustained. Such efforts need to be driven by teachers' professional interactions and networks rather than top-down modes of compliance. Sustainable improvement is linked to: a focus on teachers, distributed leadership, and alignment of curriculum in concert with the use of authentic data and evidence-based practice (Lee & Louis, 2019). The goal is to use data in a cyclical way to adjust and refine instruction across subject areas and grade levels so that improvement becomes a cultural practice inherent to the normal operations of the school (Bernhardt, 2017; Stoll et al., 2006). Research indicates that when collaboration exists and teachers are given a voice, they take on ownership of improvement, which positively impacts both implementation of change and sustainability (Goddard et al., 2007; Gumus et al., 2013).

Properties of effective collaboration. Effective collaboration is more than just meeting and sharing information among teachers. Even ineffective schools have some level of collaboration, often negative, which evidence suggests has a disproportionate impact on student learning compared to positivity (Lee & Louis, 2019). Stoll et al. (2006) related that positive collaboration is built upon trusting relationships and collegiality, and that teachers must feel safe to participate. They note four dimensions: respect, competence, personal regard for others, and integrity. They also point out certain features of collaboration which create growth opportunities: using challenging rather than prescriptive agendas, collaborative working formats featuring integrated work and indirect learning, facilitative rather than directive leadership, flexible structures, and valuing multiple perspectives of thinking.

According to Vangrieken et al. (2015), the depth of collaboration is a "balance between psychological safety and autonomy, personal ties and comfort vs. room for cognitive conflict and constructive controversy" (p. 27). They went on to point out that collaborative efforts should be focused on the primary task of teaching, with observation of other teachers' practice and ample opportunity to discuss, reflect, and learn from each other. They maintained that group learning should be prioritized over individual learning, and that hallmarks of a successful collaborative process include team members who bring to bear adequate knowledge and skills, who are willing to put in sufficient amounts of effort, and who engage in strategies which are appropriate to the work and the school setting. Vangrieken et al. (2015) went further, explaining that expertise of all team members should be used, with clear designation of individual roles and agreement on the explicit purpose of the work, which should include a fair distribution of responsibilities coupled with flexibility and the willingness to adapt to change. Finally they noted that the use of data to determine content focus and collaborative analysis and discussion also appear to be important.

Stoll et al. (2006) recognized external factors or contexts which shape and influence the effectiveness of establishing a collaborative environment. These include the orientation of individuals toward change, group dynamics, and school characteristics such as grade levels and size. They noted that small schools tend to have more engaging environments for collaboration, and that secondary schools are more complex and challenging than are elementary schools. Social and political contexts also shape these external factors. Vangrieken et al. (2015) claimed that "In countries with high

performance in education, such as Finland, teachers collaborate to a high extent with excellent results as a consequence. In other countries, this appears to be rather difficult to achieve" (p. 18). They go on to observe that in most western countries, particularly in the United States, there is "A strong-rooted culture of individualism, autonomy, and independence" and that "there is thus a need for a change of mentality in the case of teachers and education in general" (p. 36).

The Role of Leadership in Collaboration

As with leadership, the effectiveness of collaboration is contextual, depending upon individual, group, school, social and political characteristics and factors. Formal leaders seeking to support and enhance positive teacher collaboration must navigate these factors, keeping efforts focused on positive outcomes in practice and student learning (Vangrieken et al., 2015). By its very nature, collaboration requires cooperation of others and sharing of leadership, and while they cannot do it alone, the principal's role remains critical in fostering conditions in which effective collaboration can occur (Diamond & Spillane, 2016; DuFour & Berkey, 1995; Hallam et al., 2015; Hallinger, 2011; Harris, 2011, 2013; Hitt & Tucker, 2016; Leithwood et al., 2019).

Conceptually, it is useful to consider two aspects of principal behaviors or activities which support productive collaboration. One aspect is the intentional and efficient management of resources to create the conditions in which collaboration may occur. This is the technical, clerical side of principal leadership which is for the most part independent of charisma and the ability to inspire others. The other aspect is the talent

and skill of persuasion in building mutual trust, a sense of collective responsibility, and a shared vision with a focus on student learning and continuous improvement of practice.

Managing collaboration. Principals must manage as well as lead. Staff may not notice or appreciate management as much as charismatic leadership, but it is an essential first step to create the conditions in which productive collaboration can occur. This is the thankless, often unnoticed "dirty" work behind the scenes that makes collaboration possible. These facilitating tasks are required in three distinct areas: time, space, and people (Stoll et al., 2006; Vangrieken et al., 2015).

Time. Time is generally considered to be the most limiting resource in schools, particularly from the perspective of teachers. The bureaucratic structures of schools rely heavily on fixed schedules and universal coordination of parents, students and teaching activity. This constrains opportunities for collaboration, and the principal must be innovative in creating the conditions for teachers to work together. Principal activities in this regard include: aligning schedules for common planning times, supporting regular, scheduled work time in the absence of student responsibilities, and covering for teachers so that they can observe other teachers in practice or attend external professional development activities (Stoll et al., 2006; Vangrieken et al., 2015).

Space. Physical space must be provided for collaboration to occur. This is somewhat context-specific and may include classrooms, lounge areas, libraries or commons areas. Principals need to understand the culture and how it relates to the context, however. For example, a faculty lunchroom in which the norm for teachers is casual conversation or a place where gripes are often aired may not encourage a focus on

work and improvement (Stoll et al., 2006). External supports for professional development are also needed, so consideration must be given to facilities which support group learning, include access to audio-visual equipment, and provide communication technologies. Finally, convenience for teachers is also a consideration. Schools with multiple buildings face challenges if teachers must travel to meet with each other, and comfort and convenience put teachers more at ease and prepared to focus on the tasks at hand. If travel and unfamiliar environments are necessary, the principal should ensure that the work environment is both comfortable and welcoming (Stoll et al., 2006).

People. The most context-specific management area is people. The principal must recognize cultural norms, group dynamics, personality differences and leadership potential in others. When delegating leadership or accountability, consideration must also be given to current workloads and other responsibilities for individuals and teams (Stoll et al., 2006; Vangrieken et al., 2015). For example, in many schools in the United States, teachers have extracurricular responsibilities which are seasonal, so there may be periods of time which are not conducive to adding responsibilities to those individuals.

The principal also needs to know the motivations of potential leaders and followers. According to Vangrieken et al. (2015), it is important that collaboration be centered on commitment to improving student achievement across the school and that there is a balance between the needs of the team and the needs of individuals. They also note that principals should be observant and try to be aware of personality conflicts and the possibility of hidden individual agendas. Sharing leadership with individuals who do not share the values of organization learning could be counterproductive. Trust is critical

in productive collaboration; this requires understanding the current culture and the personalities of potential leaders and followers (Hallam et al., 2015).

Leading collaboration. As difficult as it is to implement management strategies which support collaboration, it is relatively straight-forward compared to providing leadership which fosters belief and positive participation in the process. The challenge is to develop and support norms of collaborative practice which are focused on the goal of continuous improvement of student learning. Hallinger and Heck (2010b) reminded us that school improvement is a dynamic process, and that each school has a different starting point and unique situation. In keeping with Spillane et al.'s (2004) conceptualization of leadership as an organizational property stretched across people and situation, there is no single prescription for necessary leadership actions. Individual personalities, group dynamics, existing culture, and community context all influence leadership activity and its effectiveness. Most scholars today view school improvement within the framework of organizational learning, with formal leaders attempting to increase capacity over time and across levels (Hallinger & Heck, 2010b). A major challenge for formal leaders is that the conditions change in response to leadership action, and leadership action must react to those changes (Harris, 2011).

Ineffective leadership practice. Most researchers agree that traditional, autocratic leadership practices are of little use in establishing productive collaboration. Leadership must be shared or distributed across the organization if positive change is to occur and achievement is to improve (Harris, 2011, 2013; Harris, Leithwood, Day, Sammons, & Hopkins, 2007; Hitt & Tucker, 2016; Lee & Louis, 2019; Muijs & Harris, 2006; Stoll

et al., 2006; Vangrieken et al., 2015). Hallinger and Heck (2010b) found that positive changes in collaborative leadership over time indirectly had positive impacts on achievement by significantly increasing academic capacity. Goddard et al. (2007) related that teacher collaboration is associated with increased levels of achievement in both math and reading. But as Harris (2013) pointed out, while collaboration can be positive, it requires coordination from the principal, who must actively and continuously redesign the organization and distribute leadership widely. This is no easy task.

Formal leaders who resist sharing leadership or who simply delegate it to others are undermining the conditions needed for authentic improvement. Hargreaves and Fink (2006) maintained that distributed leadership is always there, even if it is not intentional. "If leadership is not deliberately distributed in ways that engage teachers with the goals of the school, it will end up being distributed by default" (p. 10). They cautioned that distribution of leadership must be thoughtful and with purpose, and that deeper improvement must be embedded in the hearts and minds of the staff and the core culture. The difficult task is to truly distribute leadership as a property of the organization. While strong leaders can guide the initial process, Hargreaves and Fink (2006) commented that if it remains "always firmly directed by the close watch and guiding hand of the principal" (p. 13), it is unlikely to be sustainable and will be confined to the period of the leader's tenure. Conversely, weak leadership from the principal creates a vacuum which other staff will fill, often in negative ways and in defense of the status quo. As Hargreaves and Fink (2006) warned, "Improvement does not arise by accident, democracy and justice are not achieved by capitulating to the crowd" (p. 18).

Effective leadership practice. What then are formal leaders to do? The complex nature of schools and variation across people, situations, communities and regions means that there will likely never be a formula or descriptive set of actions which automatically increase collaboration and lead to sustainable improvement. "It depends . . ." seems to be the only platitude which can be offered. However, leadership and school improvement research over the past several decades has revealed several properties or conditions which uniformly exist in effective schools demonstrating sustainable improvement. This convergence of agreement in the literature offers several points of advice as to where principals and other formal leaders should focus their attention.

A large and growing body of literature informs us that effective principals are not forceful, gallant, or heroic. They roll up their sleeves and work closely with others as learners, working toward continuous improvement of themselves and the organization. They focus first on culture. This includes understanding the current culture and promoting and demonstrating a shared vision for where the culture needs to be. Effective schools have created cultures in which productive collaboration is expected and norms of communication are inclusive, safe for minority views to be expressed, and open to honest debate and constructive conflict of views. Group learning is valued and is based on inquiry and the effective use of data, with improvement of all student learning as the central purpose. It is essential that the principal continuously model and demonstrate these values, yet the values must ultimately be accepted by all staff and infused into the operation and purpose of the organization. Building trust is critical in the process, so principals must spend a great deal of attention on people and relationships. This cannot

be accomplished alone or in isolation, the principal needs to identify leadership potential and nurture leadership roles, both formal and informal, in others. At the same time, the effective principal recognizes and rewards the contributions and efforts of all individuals, whether in leadership roles or not.

Professional Development

Professional development is a key component in increasing staff capacity, raising standards, and improving policy and practice in education (Leithwood et al., 2008; Sachs, 2016). Stoll et al. (2006) noted that managing collaborative professional development is central to leadership, and that it can raise the confidence of teachers, increasing their belief in their power to make a difference and raising their commitment to improvement. This translates into enhanced student motivation and performance. Rosenholtz (1989) claimed that a learning enriched workplace leads to better academic progress, Louis and Marks (1998) reported higher achievement in schools with positive professional communities, and Vangrieken et al. (2015) related that "Results from the Teaching and Learning International Survey (TALIS) 2013 showed that teachers involved in collaborative learning reported using more innovative pedagogies and displayed more job satisfaction and self-efficacy" (p. 18).

Traditional professional development. Traditional professional development activities, known to many teachers as "sit 'n git" sessions, are typically orchestrated by hierarchical leadership with little input from below. They are often prepared and presented by external specialists and are meant to apply universally to all teachers within a grade level or range of grades and tend to ignore local contexts. In my experience as a

long-time educator, these sessions generally follow a modular design which allows the presentation to fill the time available on the designated training day, and there is usually little preparatory learning or follow-up after the training occurs. In this approach, teachers are viewed as technicians who should effectively apply prescribed practice to students in the course of their instruction, raising the chances of successful learning in the classroom through the scientific application of practical knowledge (Evans, 2008; Sachs, 2016). In this traditional view, teacher growth and capacity are measured by the amount of information which has been provided to them, as opposed to the depth of their professional learning.

Evans (2008) referred to this type of training as functional professional development while Sachs (2016) called it the training approach and asserted that external pressures of standardization and accountability tend to lead to this instrumentalist strategy. It is very much a practical view focused on relevance and immediate application within the classroom. This training approach "encourages teachers to see their world in terms of short-term instrumentalist ends achieved only through the recipes of tried and true practices" (Sachs, 2016, p. 420). In other words, there is no room for innovation, and teachers must rely on outside experts to define their practice.

Collaborative learning. Sachs (2016) contrasted the training approach with the teacher learning orientation, which focuses on attitudes and beliefs and is meant to be transformative in its practice. She noted that, unlike the training approach, the teacher learning approach represents authentic professional learning; it recognizes the complexity of the school environment and is meant to foster a desire for improvement. This type of

professional development takes courage and "requires building collaborative partnerships between various stakeholders whose task is to work together, combining their experience, expertise, and resources." (Sachs, 2016, p. 421). This conceptualization aligns with collaborative professional learning and distributed leadership concepts discussed in the previous sections.

Evans (2008) and Sachs (2016) each asserted that both professional development approaches have their place and ideally should operate in balanced and mutually beneficial ways. Sachs (2016) provided a useful two-dimensional continuum which illustrates the relationship between these professional development approaches and what she referred to as professionalism. In this view, professionalism is a cultural construct in which teachers operate, and ranges from managerial (individualized) to democratic (collaborative). For the purpose of this research, we may consider this view of professionalism to be analogous to a continuum of professional culture from individualized to collaborative. The two-dimensional continuum is illustrated in Figure 2 (Sachs, 2016, p. 421).

In this view, the type of professional development supported by school leaders influences both the development of collaborative culture and the sustainability of continuous improvement. Note that if professional development activities focus on functional training over teacher learning, collaboration may increase, but its nature will be based on compliance and modification, rather than on transformation and organizational improvement. Bernhardt (2017) maintained that when schools focus on

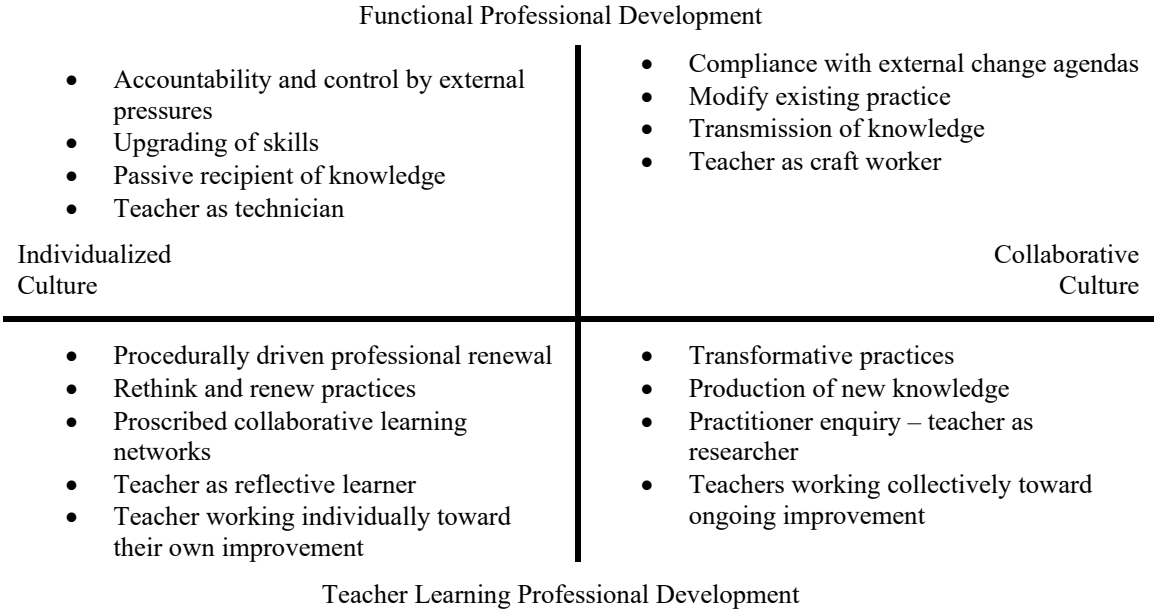

Figure 2. Types of professional development and professional culture.

compliance, they concentrate mainly on what is being measured externally, to the detriment of holistic improvement and with the exclusion of attention on subjects or students which do not fall within the frame of current accountability measures. In this case, improvement efforts are reactive and focus on filling gaps revealed in data, often with blame placed on student factors and the practices of other teachers. Professional learning becomes centered on quick fixes to close the gaps. Such learning is not reflective nor is it driven by inquiry; it is technical problem solving designed to provide temporary improvement until the next accountability cycle.

Effective professional development. Professional development which supports sustainable and continuous improvement focuses on the teacher learning process and is embedded in teaching practice itself. It is experiential, reflective, and cognitive learning which occurs as part of professional practice and through the observation and support of

peers. Features of effective professional development include the use of external expertise to solve problems of practice, teacher self-evaluation and identification of their own learning needs, increased professional dialog, and observation of peers in practice with authentic mutual support and feedback. Teachers view themselves as researchers, working collaboratively to solve problems of student learning (Muijs & Harris, 2006; Stoll et al., 2006).

In the conceptualization illustrated in Figure 2, the goal of school leaders is to move their organization toward the lower right quadrant. Distributing leadership supports this movement, but Leithwood and Mascal (2008) pointed out that teachers still perceive leadership through hierarchy, and that instructional leadership from the principal remains critical. The principal focus then is to create an intelligent, participatory hierarchy, a laissez-faire approach will not do. Principals must actively participate in professional development activities as a learner, right beside their teachers. Indeed, research indicates that of the leadership practices which have been shown to positively influence achievement, principal involvement in teacher learning has the greatest effect size on student outcomes (Hallinger, 2011; Leithwood & Mascal, 2008; Robinson, et al., 2008). This supports one of the theories behind this study; teacher learning based professional development is likely to be an important mediator in leadership's effects on teacher collaboration.

Summary of the Literature Review

Among the factors which schools can control, leadership is second only to teaching as an influence on student learning. Modern conceptual frameworks for the

empirical study of leadership influence began to emerge in the 1980s with the development of the instructional leadership framework, which is focused on the behaviors and actions of the principal in leading instruction. Over time, more comprehensive frameworks have evolved, seeking to include environmental contexts and the role that other individuals play in school leadership. Today, the distributed leadership perspective regards leadership activity as an organization property, stretched across leaders, followers and the situational context.

Research examining effective schools and school improvement continues to support the central role of the principal along with the need for leadership to be shared across the organization. The primary focus of principal leadership is increasing individual and organizational capacity through the pursuit of collaborative cultures which foster continuous organizational improvement and increased student learning. A central issue is to explain how formal leaders can effectively distribute leadership in a productive manner which positively impacts student outcomes. Professional learning communities offer promise as a professional development construct which can help bring this about through establishing a culture of collaborative professional learning and growth.

The body of literature strongly supports the importance of leadership in establishing positive collaborative cultures and in increasing teacher and organizational capacities. Research on professional learning communities and the effects of collaborative teaching practices on student outcomes demonstrates the importance of increasing teacher collaboration. But the extent and pathways of leadership influence on promoting teacher collaboration (and the conditions it requires) require further study and

clarification. This study seeks to contribute to that need by examining the influence of principal leadership practices and their relationship with professional development in supporting teacher collaboration.

Conceptual Framework

As the review of the literature indicates, educational leadership is a broad topic and current conceptualizations of leadership action in schools extend well beyond the behavior of single individuals. Yet as the formal leader of the school, principals remain the central element around which leadership action is organized and through which it is distributed to others. By its very nature, leadership distribution depends upon the productive collaboration of others, since without collaboration informal leaders would have no followers. If principals want to distribute leadership within the organization, collaboration must occur. Conceptually, increased teacher collaboration is a desired outcome.

The question then faced by the principal is, "How can increased teacher collaboration be created and supported?" Certainly, the principal has a direct influence on the teachers they supervise. Through instructional leadership they communicate expectations and seek to inspire growth and learning for each individual teacher. They may even inspire teachers to desire more effective collaboration with their peers. But without structures in place to bring people together and to provide the time and space needed, effective collaboration will be difficult to achieve. While the principal can directly influence the desire for collaboration, they must also indirectly support collaboration through the management of structures which support it. One such structure

through which this influence may act is professional development. By providing collaborative teacher-learning based professional development opportunities to their teachers, principals may indirectly influence the outcome of teacher collaboration.

The study of instructional leadership in education has a long history, but most studies focus on a single level and measure instructional leadership with school-level indicators, usually from principal responses. In this study, I conceptualized teacher-learning based professional development and teacher collaboration as teacher-level constructs, with teachers nested within schools. Principal instructional leadership remains a school-level construct, but all three constructs were measured from teacher-level indicators. In other words, this study examined instructional leadership and its influence on collaboration from the perspective of teachers.

This study sought to measure the influence of principal leadership practices on teacher collaboration, as perceived by teachers in schools in the United States. The direct influence of principal instructional leadership on teacher collaboration was investigated, as well as the indirect effect of principal leadership acting through effective professional development. Figure 3 displays the conceptual framework of the relationships between these variables and across the levels.

The research questions explored in this study were: (1) Does principal instructional leadership influence teacher collaboration, and if so, to what extent? (2) Does the level of teacher-learning-based professional development influence teacher collaboration, and if so, to what extent? (3) Is the effect of instructional leadership on

teacher collaboration mediated through teacher-learning based professional development, and if so, to what extent?

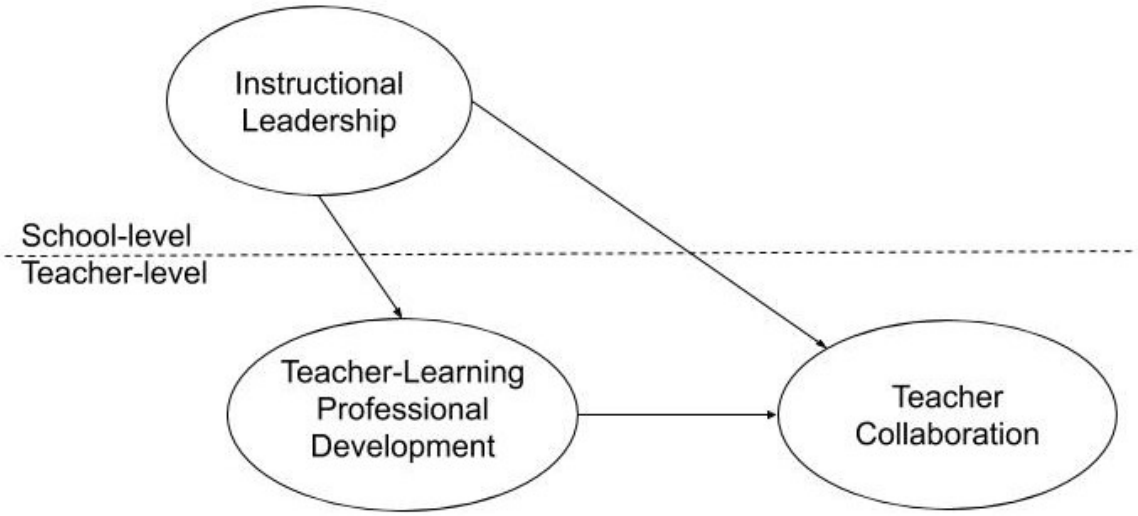

Figure 3. Conceptual framework.

Chapter 3

Research Methods

This chapter provides the research paradigm and design methodology for the study. It provides details of the data source, population, and sample participants along with specific information regarding the development of the latent independent and dependent variables. The analysis procedures and the statistical model used for the study are also presented.

Research Paradigm

This study investigated the influence of instructional leadership and teacher professional development practices on teacher collaboration, using an inferential quantitative design. The research process made use of multilevel structural equation modeling (MSEM) of public use data collected in the 2013 administration of the Teaching and Learning International Survey (TALIS) conducted and managed by the Organization for Economic Co-operation and Development (OECD). The researcher was not involved in sample selection, instrument design or instrument administration. For this reason, an inferential quantitative approach was warranted.

Research Design

In this study, multilevel confirmatory factor analysis (MCFA) was used to develop latent constructs for the focused independent variables of principal instructional leadership and teacher-learning based professional development, along with the dependent variable of teacher collaboration. Confirmatory factor analysis is a technique used to verify the factor structure of observed variables and their underlying latent

constructs (Suhr, 2006). In the TALIS 2013 data, OECD (2013a) provides multiple latent scales which have been derived from observed measures in both the teacher and school international survey results. These scales provided a sound theoretical basis for developing the latent constructs derived from the United States data used in this study.

MSEM was used to examine the effect of principal instructional leadership and teacher-learning based professional development on teacher collaboration. Mediation of the leadership effect through professional development was also investigated. MSEM allows structural equation modeling to be applied to hierarchically clustered data (Heck & Thomas, 2020) in which individuals are nested within a higher-level structure. In MSEM the relative variation in the latent constructs between levels can be evaluated simultaneously in the same model. In this study, the predictors are collected at the individual (teacher) level, and teachers are clustered or nested at the school level.

Conceptually, principal instructional leadership is a school-level construct while the natural level for teacher-learning based professional development and teacher collaboration is at the teacher level. However, collaborative teacher learning and teacher collaboration in general are not individual activities but require the participation of groups of teachers. Furthermore, such activities must be supported by conditions which exist at the school level. By this reasoning, the latent constructs of teacher-learning based professional development and teacher collaboration were considered as both individual level and school-level (as aggregate) constructs in this study.

Data Source

The data used in this study were obtained from the public OECD 2013 TALIS database. According to OECD (2013b), the purpose of TALIS is to help participating countries review and develop policies to increase the effectiveness of their schools. The surveys are focused on the learning environment and working conditions of teachers in schools and TALIS is meant to provide teachers and principals the opportunity to offer their perspectives on school contexts. The information from the surveys is meant to be used by countries in the analysis of issues TALIS examines, as a means of developing policy or in identification and comparison with other countries facing similar challenges. The 2013 cycle of TALIS focused on several dimensions of policy-related matters, including school-level policies and practices related to school leadership, the impact on teachers of recent trends in school leadership and management, and the amount and type of professional development available to teachers and their needs (OECD, 2013a).

Participants and Sampling

The 2013 TALIS international data set sampled over 72,000 teachers in over 4,000 schools. Thirty-four (34) countries participated in TALIS 2013, including the United States. All participating countries were required to administer the core survey at the lower secondary level with the option of administering the survey at the primary and upper secondary levels. The United States did not participate in the primary or upper secondary options of administration. While TALIS collects data from both teachers and principals in separate surveys and develops latent constructs from both the school and teacher data, all latent constructs used in this study were derived from the United States

teacher survey. This survey sample consisted of 1,926 teachers from 122 schools, out of a survey population of 783,138 teachers in 44,236 schools. Prior to analysis, the school-level (principal survey) data was merged into the teacher-level data using the key field IDSCHOOL. Responses from the United States school-level survey were used to control for school-level principal experience, school enrollment, and whether the school was privately or publicly managed. Control items from the teacher survey were teacher-level gender, teaching experience, and class size.

Measures and Latent Constructs

Principal instructional leadership and teacher-learning based professional development were the two focused independent variables used in this study. The dependent variable was teacher collaboration. All three variables were generated as latent constructs through MCFA from individual predictors in the United States TALIS 2013 teacher survey data. These are defined below (see also Appendix A for detailed information about survey items).

Principal instructional leadership (PIL). This construct was built from responses to survey items TT2G31A-F, which are 8 questions directed at teacher perceptions of appraisal and feedback from their supervisor. For example, item TT2G31E asks, “Feedback is provided to teachers based on a thorough assessment of their teaching.” Except for two questions which were worded in a negative response mode, higher values (on a 4-point scale where 4 is “strongly agree”) indicate a higher level of instructional leadership. The two negative mode questions were TT2G31B: “Teacher appraisal and feedback have little impact upon the way teachers teach in the classroom,”

and TT2G31C: “Teacher appraisal and feedback are largely done to fulfil administrative requirements.” Responses to these two items were reverse coded prior to analysis so that as with the other questions, higher values indicate a higher level of instructional leadership. However, MCFA indicated weak factor loadings for both items, so they were excluded from the measure. One other item, TT2G31F: “If a teacher is consistently under-performing, he/she would be dismissed” was also rejected due to a weak factor loading and poor model fit.

Professional development (TLPD). As discussed in the literature review, professional development can be conceptualized as being oriented toward “teacher-training” or “teacher-learning” (Sachs, 2016). The teacher-training orientation is meant to be a functional, non-collaborative and very practical approach to professional development. In contrast, the teacher-learning approach is characterized as collaborative, authentic professional learning in which teachers combine their expertise to explore and learn together in the pursuit of individual and organizational improvement. The teacher-learning approach is aligned with the concept of organizational learning and supports increased teacher collaboration. This type of professional development is generally associated with professional learning communities in the literature and is the orientation of interest for this study.

TALIS 2013 includes individual-level predictors directed at both orientations of professional development, but only the teacher-learning based approach is of interest in this study. In the international data set, OECD used responses to 4 characterizations of recent professional development activities to create a latent construct which was labeled

TEFFPROS and was termed “effective professional development.” This OECD index was derived from items TT2G25A-D and aligns well conceptually with the teacher-learning orientation of professional development used in this study. The latent construct derived from these items in the United States data was labeled TLPD in this analysis. TLPD served as both a predictor of the dependent variable (teacher collaboration), as well as a mediator for the effect of principal instructional leadership on teacher collaboration.

All four measures in question TT2G25A-D provided strong factor loadings and good fit indices in the CFA model. The survey question was, “Considering the professional development activities you took part in during the last 12 months, to what extent have they included the following?” The teachers responded to 4 different characterizations presented in the survey on a 4-point scale ranging from “Not in any activities” to “Yes, in all activities” with higher values indicating more participation in teacher-learning based professional development. For example, the characterization of TT2G25C was, “Collaborative learning activities or research with other teachers.”

Teacher collaboration (TCOLLAB). OECD developed two latent teacher collaboration scales from the international teacher data, using responses to eight items labeled TT2G33A-H. In the international data set, OECD grouped items TT2G33A-D to construct the latent construct TCCOLLS which was referred to as “professional collaboration.” Items TT2G33E-F were used to construct the latent construct TCEXCHS which was referred to in TALIS 2013 as “exchange and coordination among teachers.” These two subscales were then combined to create a second order latent construct

referred to as “teacher cooperation” and labeled TCOOPS. However, in the United States data, the factor loadings and model fit indices of the measured variables used for TCCOLLS were weak and there was high correlation between the two first order factors. In addition, items TT2G33A-C used for the OECD indexes did not fit well with the conceptualization of teacher collaboration used in this study, and were more oriented toward a team-teaching approach, rather than collaborative learning directed toward school improvement.

For these reasons, a new latent construct for teacher collaboration was developed for this study and is labeled TCOLLAB. MCFA indicated that the best measurement model for the concept of teacher collaboration using United States data is built from responses to items TT2G33D-H. The survey question for TT2G33 asked, “On average, how often do you do the following in this school?” For each example presented, the teachers selected one of six possible responses ranging from “Never” to “Once a week or more.” For example, item TT2G33F presented “Work with other teachers in my school to ensure common standards in evaluations for assessing student progress.” In all items, higher values indicated more time spent on collaborative learning and improvement activities with other teachers.

Analysis

The first stage of the analysis was to use MCFA to develop and validate the measurement models for the three latent constructs used in this study. This process was informed by similar constructs developed in the OECD technical report (2013a). The single-level OECD scales were based on the entire international data set, so it was

necessary to modify and validate the constructs for this multilevel study based on the United States data. To determine if multilevel analysis was appropriate, the intra-class correlation (ICC) for each measurement item was examined. ICC was calculated for each indicator in the measurement model and is defined as the ratio of the variance between clusters to the total variance of the indicator both between and within clusters. ICC values greater than 0.05 indicated that multilevel analysis was warranted.

In multilevel analysis in which a latent construct is developed using individuals within clusters as the information source, the researcher must determine if the resulting construct is truly shared across clusters. A shared construct implies that there is little variance between responses from members of the cluster. If this condition is not met, then the construct should be treated as configural, and the predictors should be held invariant across levels (Stapleton & Johnson, 2019; Stapleton, Yang, & Hancock, 2016). This determination was made by examining the calculated ICC2 values in the measurement models for each latent construct. Whereas ICC is defined as the ratio of between-level variance to the total variance for an indicator, ICC2 replaces the within-cluster variance term in the ICC calculation with the ratio of the within-cluster variance to the average cluster size. ICC2 values of at least 0.8 for the individual predictors indicate that within-cluster variation is small enough to consider the construct to be shared across clusters, while smaller values indicate that the construct should be treated as configural.

The next stage of the analysis was to develop the MSEM models to analyze the influence of principal instructional leadership (PIL) and teacher-learning based professional development (TLPD) on teacher collaboration (TCOLLAB). This was done

in four steps. The first step was to estimate the direct influence of PIL on TCOLLAB at the school level. The second step was to estimate the direct effect of TLPD on TCOLLAB at both the individual and school levels. The third step was to add a mediation path for the influence of PIL on TCOLLAB through TLPD at the school level. The overall statistical model is presented in Figure 4.

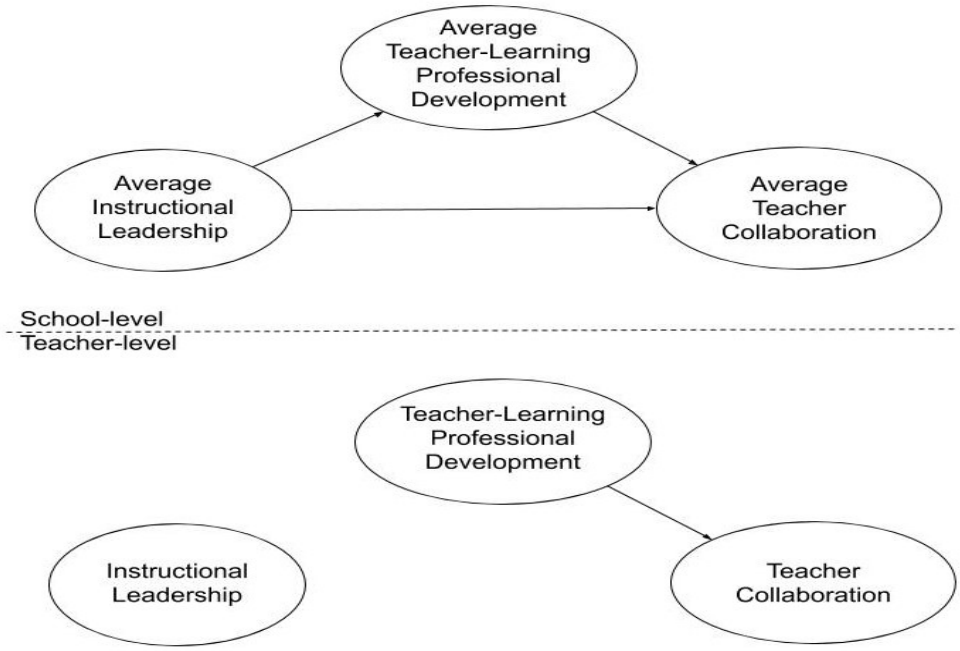

Figure 4. Statistical model.

Finally, control variables were included at both levels. Controls at the teacher level were teacher gender (TT2G01), teaching experience (TT2G05b), and class size (TT2G38). At the school level, controlling variables for principal experience (TC2G04b), public or private management (TC2G10), and school enrollment (TC2G14) were included. Previous studies suggest that school size may be a factor in the ability to foster

a collaborative culture (Stoll et al., 2006) and that teacher gender and average classroom size have significant effects on measures of teacher collaboration (Gumus et al., 2013).

All data analysis was done with MPlus v. 8.3 software by Muthen and Muthen. Teacher sample and replicate weights provided by OECD in the TALIS 2013 data were used in the single-level CFA, and teacher and school sample weights were used in the multi-level analyses. The maximum likelihood estimation with robust standard errors (MLR) method was used to estimate all models. SPSS v. 26 was used for data preparation and N2Mplus was used to prepare the data files for use in MPlus. All results are presented in Chapter 4.

Summary

Given the importance of teacher collaboration in school improvement efforts, the central role of the principal, and the influence of professional development on both teacher and organizational capacity, this study addressed questions regarding the influence of principal instructional leadership practices and teacher-learning based professional development on teacher collaboration. It also investigated possible mediation of instructional leadership effects through professional development while controlling for several teacher and school level background variables.

A multilevel structural equation modeling analysis using Mplus software and the TALIS 2013 public use data from the United States was used to answer these questions: (1) Does principal instructional leadership influence teacher collaboration, and if so, to what extent? (2) Does the level of teacher-learning-based professional development influence teacher collaboration, and if so, to what extent? (3) Is the effect of instructional

leadership mediated through teacher-learning based professional development, and if so, to what extent? (4) Which teacher and school background factors, if any, influence teacher collaboration?

Chapter 4

Results

The purpose of this study was to investigate the influence of principal instructional leadership on teacher collaboration, and to examine the role teacher-learning based professional development may play in this influence. Principal instructional leadership was conceptualized as a school-level construct and was derived as a latent independent variable through multilevel confirmatory factor analysis (MCFA) based on teacher perceptions of principal feedback. Teacher-learning based professional development was conceptualized as existing at both the teacher and school-levels and was derived as a latent construct through MCFA based on teacher perceptions of professional development activities they had participated in over the past year. The dependent variable of teacher collaboration was also conceptualized as existing at both the teacher and school-levels. This variable was derived as a latent construct from teacher perceptions of how often, on average, they had participated in collaborative planning and growth activities.

The analysis was completed in two stages. After merging the United States school and teacher level data, trimming and recoding was completed in SPSS v. 26, and the resulting data was exported for analysis in MPlus v. 8.3 with N2MPlus software. Following data preparation, the first stage of the analysis was the development of the latent constructs through MCFA. The second stage employed multilevel structural equation modeling (MSEM) using MPlus to build three successive models by adding paths between the constructs at the appropriate levels. The first model examined the

influence of principal instructional leadership on teacher collaboration in the absence of any influence from professional development. The second model examined the influence of professional development on teacher collaboration without regard to principal instructional leadership. The third model combined the effects of both independent variables and investigated possible mediation of principal instructional leadership through professional development.

Participants

The survey population for this study consisted of 783,138 teachers in 44,236 schools in the United States. The data sample consisted of 1,926 teachers from 122 schools which participated in the TALIS 2013 survey. According to the National Center for Education Statistics (NCES, n.d.), all United States teachers and their principals in public and private schools that serve students in grades 7, 8, or 9 were eligible to participate in the survey. However, the United States response rate did not meet the international technical standards set by OECD, so the United States TALIS 2013 data was reported separately and not included in the international averages, nor was it included in the scales created by OECD for the international data. NCES urges data users to take note of the potential for bias in estimates when conducting complex statistical techniques using TALIS 2013 United States data.

In the teacher sample, there were nearly twice as many females as males, and nearly 40% had 15 or more years of experience, reflecting trends noted by Ingersoll et al. (2018) that the United States teaching force is largely female and becoming older. In contrast to teacher experience levels, 72% of principals reported less than 10 years of

experience, with none reporting 20 or more. Despite the national trend noted by Ingersoll et al. (2018) of teacher employment growth outstripping student enrollment growth, over 72% of teachers in the TALIS 2013 survey reported class sizes larger than 20 students. Of the 98 schools reporting enrollment data, only 14 reported enrollments of 300 students or fewer. Relevant descriptive statistics for participating teachers and schools are presented in Table 3.

Table 3

Descriptive Information on the United States Sample

Demographic	*N*	Frequency	Percent
Teacher Gender	1925	Female: 1269	65.9
		Male: 656	34.1
Teacher Experience	1913	0-4 years: 314	16.4
		5-9 years: 453	23.7
		10-14 years: 393	20.5
		15-19 years: 263	13.7
		20 or more: 490	25.6
Teacher Class Size	1496	1-20: 417	27.9
		Above 20: 1079	72.1
Principal Experience	100	0-4 years: 29	29.0
		5-9 years: 43	43.0
		10-14 years: 23	23.0
		15-19 years: 5	5.0
		20 or more: 0	0
Private/Public School	98	Private: 9	9.2
		Public: 89	90.8
School Enrollment	98	1-300: 14	14.3
		301-600: 33	33.7
		601-900: 21	21.4
		More than 900: 30	30.6

Note. N denotes only valid data; missing responses are not included.

Measurement Models

The latent constructs used in this study were developed by creating and evaluating measurement models developed through MCFA procedures using MPlus software. For each latent construct, selection of candidate indicators from the teacher data was guided by OECD's (2013a) creation of analogous scaled variables using the TALIS 2013 international data. Because the United States did not meet the response rates set by OECD, United States data was not included in the scales created by OECD, and each construct required independent validation. Descriptive statistics for each indicator considered in each latent construct are included in Table 4.

MCFA provided three important validations for each latent construct. The first was to determine which factors produced the best fit for each measurement model. Removing items with non-significant or weak (less than 0.4) standardized factor loadings improved the model fit. The second validation determined the appropriateness of multilevel analysis through the calculation of the intraclass correlation (ICC) for each indicator. ICC values indicated the variance at the school level for each of the measured items. Values greater than .05 indicated that there was enough variance at the school level to justify a multilevel approach.

The third validation was the calculation of ICC2 for each factor. ICC2 is a measure of the within-cluster agreement of the responses to individual indicators used to develop the construct. Latent constructs which are truly shared across clusters should have a low variance within each cluster (Stapleton & Johnson, 2019; Stapleton et al., 2016). For items to be considered as shared across clusters, ICC2 should be 0.8 or above

Table 4

Descriptive Statistics for the Candidate Factors of the Latent Constructs

Construct	Indicator	*N*	Min-Max	*M*	*SD*
Principal Instructional Leadership	TT2G31A	1844	1-4	2.34	0.820
	TT2G31B[ab]	1843	1-4	2.66	0.733
	TT2G31C[ab]	1845	1-4	2.30	0.819
	TT2G31D	1843	1-4	2.54	0.768
	TT2G31E	1843	1-4	2.49	0.801
	TT2G31F[b]	1827	1-4	2.35	0.843
	TT2G31G	1830	1-4	2.76	0.714
	TT2G31H	1821	1-4	2.51	0.819
Teacher-learning based Professional Development	TT2G25A	1770	1-4	2.70	0.911
	TT2G25B	1762	1-4	2.47	0.860
	TT2G25C	1763	1-4	2.39	0.881
	TT2G25D	1761	1-4	1.96	0.922
Teacher Collaboration	TT2G33A[b]	1857	1-6	2.57	2.019
	TT2G33B[b]	1854	1-6	2.03	1.339
	TT2G33C[b]	1853	1-6	2.20	1.410
	TT2G33D	1851	1-6	4.34	1.578
	TT2G33E	1852	1-6	4.78	1.432
	TT2G33F	1855	1-6	4.07	1.729
	TT2G33G	1851	1-6	4.00	1.874
	TT2G33H	1854	1-6	3.93	1.508

Note. Valid *N* (listwise) = 1644.
[a] Reverse Coded
[b] Excluded from final model.

for all or most of the indicators. None of the constructs in this study could meet this requirement and all were treated as configural, with the individual factors held invariant across levels. However, two of the five indicators of the TCOLLAB construct did meet the 0.8 criterion for consideration as a shared construct.

Principal instructional leadership (PIL). Eight (8) candidate factors were selected as possible indicators for the PIL construct. These indicators were previously described in Chapter 3. Standardized factor loadings, ICC, and ICC2 calculation results

are presented in Table 5. Items TT2G31B, TT2G31C, and TT2G31F were excluded from the final measurement model due to weak factor loadings and poor model fit. MCFA revealed a small negative residual variance for item TT2G31G and it was fixed to zero. ICC values for the remaining factors ranged from .072 to .120, indicating significant variance between schools and providing justification for a multilevel approach. ICC2 values ranging from .533 to .671 did not meet the criterion of 0.8 necessary to indicate a shared construct. Consequently, PIL was treated as a configural variable in the analysis, with factor loadings constrained across levels.

Table 5

Estimates of the Standardized Factor Loadings for the PIL MCFA Model

Indicator	Within	Between	ICC	ICC2
TT2G31A	.440(.040)*	.641(.091)*	.072	.533
TT2G31B[ab]	.193(.042)*	.562(.220)*	.024	.239
TT2G31C[ab]	.350(.034)*	.589(.092)*	.051	.452
TT2G31D	.695(.021)*	.934(.061)*	.094	.604
TT2G31E	.713(.028)*	.832(.055)*	.102	.625
TT2G31F[b]	.471(.031)*	.552(.065)*	.099	.615
TT2G31G[c]	.741(.023)*	.999(.000)*	.086	.572
TT2G31H	.628(.026)*	.732(.063)*	.120	.671

Note. Values within parentheses are standard errors.
[a] Reverse coded.
[b] Excluded from final model.
[c] Residual variance fixed to zero.
*$p < .05$.

Except for TT2G31A (0.440), the standardized factor loadings for the final measurement model were all above 0.628 at the teacher level, and all were above 0.641 at

the school level, indicating strong relationships between the indicators and the PIL latent variable at both levels. Model fit indices for the PIL measurement model based on the 5 remaining factors are presented in Table 8. The indices indicate a good fit with the data (CFI = .979; TLI = .972; RMSEA = .033; and $SRMR_{within}$ = .029 and $SRMR_{between}$ = .066).

Professional development (TLPD). As described in Chapter 3, four candidate factors were selected for the TLPD construct based on similar scales developed by OECD for the TALIS 2013 international data. MCFA revealed strong standardized factor loadings above 0.505 at the teacher level and above 0.743 at the school level for each indicator, and all were significant. Standardized factor loadings, ICC, and ICC2 calculation results are presented in Table 6. ICC values ranged from .069 to .091 indicating significant variance at the school level and supporting the multilevel approach. ICC2 values ranged from .514 to .589, which is less than the criterion of .80 required to indicate a shared construct. TLPD was thus a configural variable and the factor loadings were held constant across levels in both MCFA and MSEM analyses.

Model fit indices for the TLPD measurement model are presented in Table 8. The indices indicate a good fit with the data at the teacher level (CFI = 1.000; TLI = 1.004; RMSEA = .000; and $SRMR_{within}$ = .011), but $SRMR_{between}$ with a value of .121 may indicate a weakness in TLPD as a school-level construct.

Table 6

Estimates of the Standardized Factor Loadings for the TLPD MCFA Model

Indicator	Within	Between	ICC	ICC2
TT2G25A	.509(.029)*	.766(.113)*	.069	.516
TT2G25B	.744(.024)*	.894(.064)*	.069	.514
TT2G25C	.761(.025)*	.969(.061)*	.091	.589
TT2G25D	.505(.033)*	.743(.093)*	.076	.542

Note. Values within parentheses are standard errors.
*p < .05.

Teacher collaboration (TCOLLAB). Standardized factor loadings, ICC, and ICC2 calculation results for TCOLLAB are presented in Table 7. The factors considered for TCOLLAB were described in Chapter 3. Of the eight factors considered, items TT2G33A, TT2G33B, and TT2G33C were conceptually related to team-teaching activities centered on a specific class and did not align well with the conceptualization of teacher collaboration for teacher learning and school improvement used in this study. TT2G33A asked how often the teacher taught as a team in the same class, TT2G33B referred to observing other teachers' classes and providing feedback, and TT2G33C referenced engaging in joint teaching activities across classes and age groups. This was reflected in the relatively weak factor loadings for all three indicators and a poor model fit when all were included. All three factors were excluded from the final measurement model for TCOLLAB.

Table 7

Estimates of the Standardized Factor Loadings for the TCOLLAB MCFA Model

Indicator	Within	Between	ICC	ICC2
TT2G33A[b]	.379(.029)*	.572(.066)*	.104	.639
TT2G33B[b]	.401(.029)*	.431(.060)*	.177	.764
TT2G33C[b]	.373(.035)*	.581(.071)*	.070	.539
TT2G33D	.657(.025)*	.782(.058)*	.173	.761
TT2G33E	.613(.028)*	.914(.045)*	.053	.454
TT2G33F[c]	.731(.021)*	.935(.045)*	.127	.684
TT2G33G	.549(.030)*	.617(.077)*	.223	.811
TT2G33H	.589(.027)*	.584(.074)*	.253	.838

Note. Values within parentheses are standard errors.
[b] Excluded from final model.
[c] Residual variance fixed to zero.
*p < .05.

For the remaining five factors, standardized factor loadings were all above 0.549 at the teacher level and 0.617 at the school level. ICC values ranging from .053 to .253 indicated significant variance between schools. Of the three latent constructs, ICC2 values for the TCOLLAB indicators came the closest to approaching the criterion for shared constructs, with two indicators exceeding the level of .80. However, the other three ICC2 values ranged from .454 to .761, so TCOLLAB was treated as a configural variable with factor loadings constrained across levels.

Of the three latent constructs in this study, the model fit indices for TCOLLAB were the weakest, though generally adequate (CFI = .911; TLI = .881; RMSEA = .063; and $SRMR_{within}$ = .049 and $SRMR_{between}$ = .366). As with the TLPD construct, the large value for $SRMR_{between}$ may indicate a weakness of the TCOLLAB measurement model as

a school-level indicator. It is worth noting that in the TALIS 2013 international data, items TT2G33A-D and TT2G33E-H were included in separate subscales, which were then combined to create a latent measure for teacher cooperation. However, in the United States data, the factor loadings and model fit indices for the subscale TCCOLLS (derived from TT2G33A-D) were weak and there was high correlation between the two first order factors. This slight divergence from the original survey design may partially explain the weaker model fit indices for the TCOLLAB measurement model. Model fit indices for the TCOLLAB measurement model are presented in Table 8.

Table 8

Model Fit Indices for the Final MCFA Measurement Models for Each Latent Construct

Index	PIL	TLPD	TCOLLAB
$\chi 2$(df)	45.399(15)*	5.056(7)	125.945(15)*
CFI	.979	1.000	.911
TLI	.972	1.004	.881
RMSEA	.033	.000	.063
SRMRw	.029	.011	.049
SRMRb	.066	.121	.366
AIC	18941.149	16612.046	32110.195
BIC	19051.618	16705.195	32220.741

*$p < .05$.

MSEM Model Results

The second, MSEM stage of the analysis was completed in three steps. In each of the three models, teacher-level factors of gender, total teaching experience, and class size

were included as controls. School-level factors of principal experience, school enrollment, and school management type (private vs. public) were also controlled. Conceptually PIL exists only as a school-level construct, so it was not regressed on any variables at the teacher level. The first model (M1) calculated the direct effect of PIL on average TCOLLAB at the school level without the influence of TLPD. The second model (M2) explored the influence of TLPD on TCOLLAB at both the teacher and school levels, without the influence of PIL. The final model (M3) combined the first two models to investigate the influence of PIL on TCOLLAB with mediation through TLPD. The standardized estimates at both teacher and school levels for the factors in all three models are presented in Table 9, with model fit indices presented in Table 10.

The influence of principal instructional leadership. Model 1 revealed a significant school-level effect of PIL on TCOLLAB, with a standardized factor loading of 0.451. None of the factors for the teacher level control variables were significant, and at the school level, only the school enrollment influence was significant with a standardized factor of 0.501. This indicates that schools with higher enrollments tend to have more teacher collaboration, as measured in this study. Model fit indices for Model 1 were marginal (CFI = .891; TLI = .877; RMSEA = .040; and $SRMR_{within}$ = .077 and $SRMR_{between}$ = .243), indicating the possibility of missing elements in the influence of PIL on TCOLLAB. The R-square value of .571 indicated that Model 1 factors account for 57.1% of the variation in teacher collaboration at the school level.

Table 9

Standardized Estimates for the MSEM Models

Model	Dependent Variable	Independent Variable	Teacher-level Effect (SE)	School-level Effect (SE)
M1	TCOLLAB	PIL		.451(.157)*
	TCOLLAB	Gender[d]	.039(.039)	
	TCOLLAB	Experience	-.077(.051)	
	TCOLLAB	Class Size	-.063(.043)	
	TCOLLAB	Prin. Experience		-.067(.119)
	TCOLLAB	School Enrollment		.501(.088)*
	TCOLLAB	Private vs. Public[e]		.233(.148)
R-square	TCOLLAB		.011(.010)	.571(.120)*
M2	TCOLLAB	TLPD	.320(.043)*	.603(.125)*
	TCOLLAB	Gender[d]	.037(.036)	
	TCOLLAB	Experience	-.067(.049)	
	TCOLLAB	Class Size	-.064(.048)	
	TCOLLAB	Prin. Experience		-.022(.111)
	TCOLLAB	School Enrollment		.444(.094)*
	TCOLLAB	Private vs. Public[e]		.282(.104)*
R-square	TCOLLAB		.112(.027)*	.704(.129)*
M3	TLPD	PIL		.709(.131)*
	TCOLLAB	PIL		.035(.291)
	TCOLLAB	TLPD	.344(.043)*	.591(.247)*
	Indirect			.419(.212)*
	TCOLLAB	Gender[d]	.038(.036)	
	TCOLLAB	Experience	-.064(.049)	
	TCOLLAB	Class Size	-.063(.048)	
	TCOLLAB	Prin. Experience		-.037(.111)
	TCOLLAB	School Enrollment		.463(.093)*
	TCOLLAB	Private vs. Public[e]		0.216(.125)
R-square	TCOLLAB		.127(.029)*	.692(.125)*
R-square	TLPD			.503(.186)*

[d] Male = 0, female = 1.
[e] Private = 0, public = 1.
*p < .05.

Table 10

Model Fit Indices for the MSEM Models

Index	M1	M2	M3
$\chi 2$(df)	391.796(132)*	249.998(107)*	528.425(239)*
CFI	.891	.917	.911
TLI	.877	.902	.901
RMSEA	.040	.033	.031
SRMRw	.077	.041	.051
SRMRb	.243	.244	.218
AIC	33973.535	32089.323	44645.192
BIC	34219.433	32324.937	44998.670

*$p < .05$.

The influence of professional development. In the absence of the influence of PIL, Model 2 indicated significant effects of TLPD on TCOLLAB at both the teacher and school levels. On the teacher level, the influence was relatively weak with a standardized factor loading of 0.320, while at the school level the influence was stronger with a factor loading of 0.603. As in Model 1, none of the factors for the teacher level control variables were significant, but at the school level, both school enrollment and management type were positive and significant. The school enrollment factor was moderate at 0.444 while the influence by the type of management was much smaller at 0.282. It should be noted that only 9 of 92 responding schools reported private management, with private schools coded as zero, and public schools coded as 1. This indicates a slightly higher level of teacher collaboration in public schools, which is the opposite effect to that reported by Gumus et al. (2013).

Model fit indices for Model 2 were superior to those of Model 1 (CFI = .917; TLI = .902; RMSEA = .033; and $SRMR_{within}$ = .041 and $SRMR_{between}$ = .244), and AIC and BIC were both lower for Model 2 as well, indicating that TLPD is a better predictor of teacher collaboration that PIL alone. The R-square statistic indicated that the factors in Model 2 accounted for 11.2% of the variation in TCOLLAB at the teacher level and 70.4% of the variation at the school level.

The mediated model. To investigate the combined influence of PIL and TLPD on TCOLLAB, along with the possibility of mediation through TLPD, the first two models were combined in Model 3, with a path added between PIL and TLPD at the school level. At the teacher level, as in Model 2 the effect of TLPD on TCOLLAB was significant but relatively weak, with a standardized factor loading of 0.344. None of the teacher-level control variables of teacher gender, experience, or class size had significant effects. The value of R-square indicated a small but significant 12.7% of the variance in TCOLLAB was explained by the model at the teacher level.

The influence of TLPD on TCOLLAB was stronger at the school level, with a standardized factor loading of 0.591. The effect of PIL on TLPD was significant and strong at the school level, with a factor loading of 0.709. However, there was no significant direct effect of PIL on TCOLLAB. This result indicates that the influence of PIL on TCOLLAB demonstrated in Model 1 was fully mediated through TLPD, with a significant indirect effect of 0.419. R-square values indicated that at the school level, 69.2% of variation in TCOLLAB and 50.3% of variation in TLPD was accounted for by

the model. The estimated model diagram with standardized direct effects is presented in Figure 5.

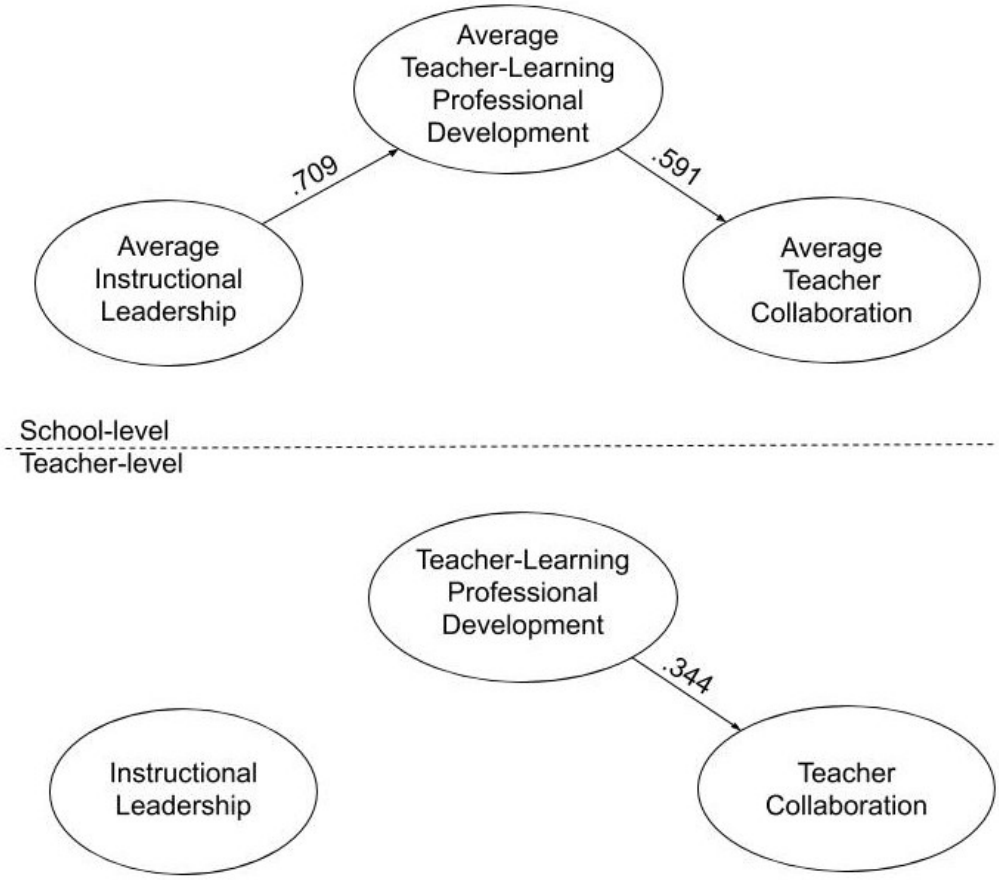

Figure 5. The estimated model 3 diagram with standardized direct effects.

For the school-level controls, the effect of management type was not significant as it was in Model 2. However, the influence of school enrollment was still positive and significant, with a standardized factor loading of 0.463, indicating that larger schools tend to have more teacher collaboration. This surprising result runs somewhat counter to Stoll et al.'s (2006) assertion that larger schools tend to be less conducive to community

identification and face-to-face interaction. However, the emphasis of that work was not specifically on teacher collaboration and was more directed toward social dynamics and teacher attitudes. As in the previous models, principal experience had no significant effect on teacher collaboration.

Model fit indices provided in Table 10 indicate that Model 3 was superior to Model 1 and compared favorably to Model 2 (CFI = .911; TLI = .901; RMSEA = .031; and $SRMR_{within}$ = .051 and $SRMR_{between}$ = .218). Correlations of the focused independent and dependent variables are included in Table 11. All correlations are significant at both levels and are much stronger at the school level.

Table 11

Model 3 Correlations Between Focused Variables.

Variable	TCOLLAB	TLPD	PIL
Within			
TCOLLAB	--		
TLPD	.304(.033)*	--	
PIL	.272(.035)*	.276(.042)*	--
Between			
TCOLLAB	--		
TLPD	.574(.125)*	--	
PIL	.510(.101)*	.671(.122)*	--

*p < .05.

The larger correlations and the stronger effect of professional development on teacher collaboration at the school level, combined with the strong influence of principal leadership on teacher-learning based professional development suggests that principals provide important and significant influence on teacher collaboration, though indirectly. Through their leadership, principal support of effective professional development strongly influences teacher collaboration. This is similar to the indirect influence principal leadership exerts on student achievement through teacher attitudes and working conditions.

Summary

This chapter provided background and descriptive statistics for schools and teachers participating in the United States administration of the 2013 Teaching and Learning International Survey (TALIS) administered by OECD. The United States administration of TALIS 2013 provided the data source for this study. From a survey population of 783,138 teachers in 44,236 schools in the United States, 1,926 teachers from 122 schools teaching grades 7, 8, and 9 comprised the survey sample. The purpose of the TALIS 2013 survey was to help participating countries review and develop policies to increase the effectiveness of their schools with a focus on the learning environment and working conditions of teachers in schools. While the OECD analysis of the international data set was used for guidance and as a template to construct the latent variables used in this study, the United States response rate did not meet the international technical standards set by OECD. Consequently, the United States TALIS 2013 data was

reported separately and was not included in the international averages, nor was it included in the scales created by OECD for the international data.

Multilevel confirmatory factor analysis (MCFA) was used to develop three latent constructs from teacher responses in the United States TALIS 2013 survey. The focused independent variable of principal instructional leadership (PIL) was developed from items related to teacher perceptions of supervisor feedback. The mediating independent variable of teacher-learning based professional development (TLPD) was constructed from items measuring teacher perceptions of recent professional development activities. The focused dependent variable of teacher collaboration (TCOLLAB) was developed from item responses to how often, on average, teachers participated in collaborative activities directed at improving student learning or their own professional growth with other teachers.

A multilevel structural equation modeling (MSEM) approach was used to investigate the influence of principal instructional leadership on teacher collaboration both directly and acting through teacher-learning based professional development. Three models were developed using MPlus software. The first model investigated the direct effect of PIL on TCOLLAB at the school level, the second investigated the direct effects of TLPD on TCOLLAB at both teacher and school levels, and the third combined the first two models to examine the influence of PIL on TCOLLAB through TLPD. Three teacher-level and three school-level controls were included in each model.

The results indicated that while there was no significant direct effect of PIL on TCOLLAB, there was a significant and moderate indirect effect acting through TLPD.

The direct effect of TLPD acting on TCOLLAB was stronger at the school level than it was at the teacher level. Of the control variables, only school enrollment had a significant effect on the outcome, indicating that larger school enrollments were associated with higher levels of teacher collaboration.

This study found that in the United States TALIS 2013 data set, principal instructional leadership significantly and positively influenced the level of teacher collaboration, but only indirectly, mediated through teacher-learning based professional development. In addition, the influence of teacher-learning based professional development on teacher collaboration was stronger at the school level than at the teacher level, indicating that principal leadership plays a significant role in supporting teacher collaboration at the school level.

Chapter 5

Discussion

Principal instructional leadership has been a topic of empirical, quantitative study by education researchers for nearly four decades. Over that span of time the conceptualization of principal leadership as well as school leadership in general has expanded and evolved dramatically. The leadership role of the principal has grown more complex, more subtle, and more distributed among stakeholders. Despite the rejection of the heroic model of the lone individual orchestrating all school change, the position of principal remains central to all efforts devoted to growth and improvement. The principal still must lead, while at the same time distributing leadership among others.

Leadership distribution presupposes two conditions. The first is that there are others willing to lead, and the second is that there are structures and contexts in which such leadership can act. Neither condition can be obtained in the absence of positive teacher collaboration. In the mid-1990s the concept of the professional learning community (PLC) began to emerge in the literature, providing a structure which could meet both conditions. In PLCs, teachers engage in collaborative learning and goal setting focused on organizational and individual growth and professional improvement. In this type of teacher-learning focused professional development, leadership is provided by teachers, based not on position or assignment but on expertise and local context. It is informally negotiated within the learning community and is fluid, shifting dynamically to meet the needs of the learning community. This type of professional development stands in contrast to traditional forms of teacher training. Conceptually, effective collaborative

professional learning structures such as PLCs provide a path through which principals may distribute leadership and increase both staff and organizational capacities.

In summarizing the current state of knowledge regarding school leadership, Leithwood et al. (2019) described four domains of practice which encompass all the roles and responsibilities of modern, effective principals. While these practices extend well beyond the more limited conceptualization of instructional leadership, principals still bear the responsibility of directly leading teachers by providing individual feedback, motivation, and support for the conditions which lead to improved instructional practice. Given that collaborative professional learning activities have proven effective in improving instructional capacity, it is natural to wonder if modern instructional leadership, despite its individualized, non-distributed nature, leads to increased collaboration among teachers. Further, if effective instructional leadership does lead to increased teacher collaboration, by what mechanisms or structures does it act?

The purpose of this study was to investigate whether teacher perceptions of principal instructional leadership influenced the level of teacher collaboration, and if so, if this effect was mediated by teacher-learning based professional development activities. The data source was the United States administration of the 2013 Teaching and Learning International Survey (TALIS) administered by the Organization for Economic Co-operation and Development (OECD). The participating sample included 1,926 teachers in 122 schools, from a survey population of 783,138 teachers in 44,236 schools in the United States (OECD, 2013a). The focused research questions were: (1) Does principal instructional leadership influence teacher collaboration, and if so, to what extent? (2)

Does the level of teacher-learning-based professional development influence teacher collaboration, and if so, to what extent? (3) Is the effect of instructional leadership on teacher collaboration mediated through teacher-learning based professional development, and if so, to what extent?

Conclusions

The results of this study indicated that at the school level, principal instructional leadership significantly influenced teacher collaboration, but that the effect was indirect and was fully mediated by teacher-learning based professional development. In other words, principal instructional leadership did not directly cause teachers to collaborate more, but when principal leadership supported professional development focused on teacher learning, collaboration increased as a result. This conclusion bears parallels with well-documented findings in the literature that principal leadership strongly influences student achievement, but only indirectly, acting through influence on teacher attitudes and working conditions. This study supports a theme that has been emerging for some time in the literature: much of the effective principal's role is not to lead change directly, but rather to create, manage and support the school climate, structures, and conditions in which positive outcomes can happen.

In this multilevel analysis, instructional leadership exists conceptually only at the school level and was therefore not investigated as a construct at the teacher level. As a configural variable, PIL represented the average teacher perception of principal instructional leadership at each school. TLPD and TCOLLAB were both also treated as configural variables but were conceptualized as existing primarily as teacher-level

constructs. However, while TLPD demonstrated a significant positive influence on TCOLLAB at both teacher and school levels, the effect was notably stronger at the school level. Correlations between all the latent factors were also significantly larger at the school level, as were the percentages of variation in the dependent variable explained by the models. This suggests that TLPD, TCOLLAB, or both constructs may include components that belong conceptually at the school-level as shared latent variables.

Support for this idea is demonstrated most clearly in the multilevel confirmatory factor analysis of the TCOLLAB construct, in which two of the five indicators possessed enough agreement within individual responses to produce ICC2 values exceeding .80 and a third just under that value at .761. It appears that there is less agreement among teachers within a school in their perceptions of leadership, professional development and their opportunities to collaborate, than there is between schools when aggregate effects are examined. Future studies should seek to investigate the nature of the shared vs. configural aspect of both constructs.

Of the six demographic indicators investigated, only school enrollment showed significant influence on teacher collaboration. The results indicated that larger enrollments were associated with greater levels of teacher collaboration. This stands in contrast to the assertion by Stoll et al. (2006) that, based on review of international studies in PLC effectiveness, smaller schools support better communication flow and greater face-to-face interaction, leading to more effective PLCs. On the other hand, Gumus et al. (2013) used the international TALIS 2008 data set to study teacher collaboration in Turkish schools and found no significant influence of school size on the

level of teacher collaboration, although their results did indicate that smaller class sizes were associated with greater teacher collaboration. That particular relationship was not supported in this study, which found no significant influence of class size on collaboration. This lack of consistency with findings based on international data is not surprising. As Vangrieken et al. (2015) noted, in measuring collaboration it is difficult to draw parallels across international data with most western countries, particularly the United States, due to "a strong-rooted culture of individualism, autonomy and independence" (p. 36).

Recommendations

Principals face many challenges and those challenges seem to mount each year. Shifting political pressures and top-down policy changes are not new features of public education, but the rapidity of cultural change, evolution of communication technologies, and societal polarization continuously change the context in which school leadership operates. In addition, the relationship between leadership and the context in which it operates is reciprocal; leadership influences the context, and the context in turn influences the scope and mechanisms through which leadership acts. School leadership is no longer viewed strictly as actions and behaviors centered on an individual. The shortcomings of the individualistic, heroic approach to leadership have long been recognized by researchers, along with the need for increased collaboration and distributed leadership. Yet the literature has little to say about specific strategies and practices which could be utilized by principals to successfully implement these strategies.

Leithwood et al. (2019) note that researchers generally agree on specific leadership practices which are common among successful schools. Effective leaders create and communicate a compelling, shared vision, build instructional and organizational capacity, focus on productive and trusting relationships, support and distribute leadership among others, and manage the instructional program so that teachers can focus on student learning. But researchers also agree that leadership practice is highly contextual, distributed over leaders, followers and the situation. Knowing what great leaders do does not necessarily inform principals on how they should do it, given their specific context.

The results of this study demonstrate that teacher-learning based professional development provides a specific, high-yield structure which, if implemented well, may serve as a path to increase teacher collaboration. Increasing positive teacher collaboration is not in itself the main goal, but it is a necessary component which must exist if principals are to be successful in distributing leadership, developing a shared vision and goals, building positive relationships, and increasing instructional and organizational capacity. Principals who wish to positively influence student outcomes would be wise to focus on supporting the structures and mediating conditions which lead to greater teacher collaboration, learning, and instructional capacity. This work is perhaps not as appealing to principals as the flashy inspirational and charismatic leadership often depicted in popular culture. But the body of scholarly research clearly indicates that effective principals exert most of their influence behind the scenes, creating and managing the conditions in which others share leadership roles, participate in learning as a community

of practice, and seek to improve both themselves and the organization for the benefit of all students.

Future Research

Theoretically, principal instructional leadership should be a shared construct; that is, it should be a property or characteristic of the school, even when measured at the individual level. Measurements of the construct collected at the individual level should therefore have little variation within the cluster (Stapleton et al., 2016; Stapleton & Johnson, 2019). That was not the case in this study, with ICC2 values of the principal instructional leadership indicators ranging from .533 to .671. Developing a shared construct is dependent upon the quality and wording of the measurement items themselves (Heck & Thomas, 2020), and future studies on this topic using a multilevel approach in which the measures are taken at the individual level should seek indicators which lend themselves to less variation within the cluster.

For the instructional leadership construct used in this study, the indicators chosen served as a proxy for measuring instructional leadership. There were no teacher-level indicators specifically designed to measure the instructional leadership construct, they were intended by OECD to measure the quality of feedback provided to the teacher by the principal. TALIS 2013 did not seek to measure the instructional leadership construct at the individual level, though it was intentionally measured at the school level based on responses provided by the principal, and thus would have no individual level representation.

The other two latent constructs developed in this study were teacher-learning based professional development and teacher collaboration. Theoretically, both constructs can be conceptualized as existing at both levels. Teachers collaborate as individuals but within groups, and TLPD necessarily requires group learning, so both constructs can be considered as existing at both levels. Some of the items used to measure the collaboration construct did meet the ICC2 criterion, indicating the possibility of creating a shared construct to measure school-level collaboration. It would be worthwhile to explore such constructs of teacher collaboration in future studies. None of the TLPD indicators approached an ICC2 of .8, however. In this study, both constructs were treated as configural, but future studies should investigate individual-level measures which could more properly measure these constructs as shared variables with the level of interest at the school level.

In broader terms, the challenge for educational leadership research moving forward is to expand on what is known empirically about successful leadership practices and to provide details on how these practices may be implemented. Though this study has contributed some insight into one possible path of implementation to achieve the desired outcome of increased teacher collaboration, it is unlikely that cross-sectional quantitative studies alone will provide much further illumination into leadership practice. More complex, sophisticated, and multi-method approaches will be needed to tease out the details of contextual leadership and its influence across organizations.

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Appendix A

Measured Items for Latent Constructs

Table A1

Measured Items for Principal Instructional Leadership.

Scale	Item number in TALIS	Question: How strongly do you agree or disagree with the following statements about this school?
Principal Instructional Leadership (PIL)	TT2G31A	The best performing teachers in this school receive the greatest recognition (e.g. rewards, additional training or responsibilities).
	TT2G31B[ab]	Teacher appraisal and feedback have little impactupon the way teachers teach in the classroom.
	TT2G31C[ab]	Teacher appraisal and feedback are largely done to fulfil administrative requirements.
	TT2G31D	A development or training plan is established for teachers to improve their work as a teacher.
	TT2G31E	Feedback is provided to teachers based on a thorough assessment of their teaching.
	TT2G31F[b]	If a teacher is consistently under-performing, he/she would be dismissed.
	TT2G31G	Measures to remedy any weaknesses in teaching are discussed with the teacher.
	TT2G31H	A mentor is appointed to help the teacher improve his/her teaching.

Source: OECD (2013)
[a] Reverse coded.
[b] Excluded from final model.

Table A2

Measured Items for Teacher Learning Based Professional Development.

Scale	**Item number in TALIS**	**Question: Considering the professional development activities you took part in during the last 12 months, to what extent have they included the following?**
Teacher Learning Professional Development (TLPD)	TT2G25A	A group of colleagues from my school or subject group
	TT2G25B	Opportunities for active learning methods (not only listening to a lecturer)
	TT2G25C	Collaborative learning activities or research with other teachers
	TT2G25D	An extended time-period (several occasions spread out over several weeks or months)

Source: OECD (2013)

Table A3

Measured Items for Teacher Collaboration.

Scale	Item number in TALIS	Question: On average, how often do you do the following at this school?
Teacher Collaboration (TCOLLAB)	TT2G33A[b]	Teach jointly as a team in the same class
	TT2G33B[b]	Observe other teachers' classes and provide feedback
	TT2G33C[b]	Engage in joint activities across different classes and age groups (e.g. projects)
	TT2G33D	Exchange teaching materials with colleagues
	TT2G33E	Engage in discussions about the learning development of specific students
	TT2G33F	Work with other teachers in my school to ensure common standards in evaluations for assessing student progress
	TT2G33G	Attend team conferences
	TT2G33H	Take part in collaborative professional learning

Source: OECD (2013)
[b] Excluded from final model.